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The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

AGED BLIND DEALER'S APPEAL TO THE PRESIDENT OF U. S.

Editor R & M:

I want to ask your help in the following matter, I am an alien and when entering this country enlisted in the American Navy taking out my first papers, but failed to take out the final papers, so when I applied for my Old Age Pension I found I was still an alien. The only recourse I have is an appeal to the President and I need all the help I can get. I thought if I appealed to the multitude of people who know me they could help me in the following manner, by writing a post card asking the President to grant my request as only sickness has interferred with my willingness and ability to make a living, and now to top all my other misfortunes I am blind.

Please address all cards and letters to me and I will number them and send them to Congressman McKinnon who I hope will help me to get an interview with the President.

August 8, 1950.

George W. Chambers
P. O. Box 1123
Encinitas, Calif.

Editor's Note: Mr. Chambers, who has advertised extensively as the Desert Rat's Nest, has been seriously ill for some time. As an ex-Navy man, his appeal is worthy and just and we hope it will meet with the President's approval. See page 350, July-August, 1950, ROCKS AND MINERALS, for a little story on Mr. Chambers.

Lapidary And Gem Exhibit
Oct. 28-29, 1950
Hollywood, Calif.

Hollywood Lapidary Society wishes to announce their Third Annual Lapidary and Gem Exhibit on October 28th and 29th, 1950, to be held at Plummer Park, 7377 Santa Monica Blvd., Hollywood, Califoriia.

Mrs. Ruth Kephart
P. O. Box 1728
Hollywood 28, Calif.

Schwab Lapidary Move To Larger Quarters

Henry Schwab Lapidary, Inc., formerly of 100 W. 43rd St., New York 18, N. Y. have moved to 73 W. 47th St., New York 19, N. Y.

They carry a stock of imported synthetic stones and also have a plant available on the premises, allowing them to cut synthetic stones, genuine stones, onyx, rutiles, and so on. They carry a large stock of synthetic raw material in 20 different colors.

Their new quarters, in the heart of the New York Jewelry district, are four times larger than those formerly had at the 47th St. address.

Kane Lapidary & Supply Have New Address

Kane Lapidary and Supply, formerly of 1681 E. McDowell Road, Phoenix, Ariz., are now located at 1737 E. McDowell Road, Phoenix, Ariz.

It is the same location but a new street number has been assigned to them.

Hastens To Renew!

Editor R & M:

I have received so much enjoyment from your fine magazine over the past several years that I hasten to renew my subscription lest I miss even one copy.

John G. Harkins, Jr.
Drexell Hill, Pa.

August 26, 1950

GIANT FIELD TRIP IN NEVADA
October 7-8, 1950
Boulder Beach on Lake Mead. Nevada

The Clark County Gem Collectors, Inc. (Paul O. Drury, Publicity Director, Box 1028, Las Vegas, Nev.) are sponsoring a giant field trip, October 7-8, See pages 464-466. this issue, for details.

REPRINTS AVAILABLE

There have been so many requests for reprints lately that the following bit of information may be of value. They can be supplied and at the following rates:

100 copies	2 pages	$ 3.75
100 copies	4 pages	7.25
100 copies	6 pages	$10.25
100 copies	8 pages	12.75
100 copies	10 pages	15.00

All reprints must be ordered in advance, before the articles make their appearance in print.

ROCKS and MINERALS
PUBLISHED MONTHLY

Edited and Published by
PETER ZODAC

September-October
1950

EXPLORING IN NORTHERN ONTARIO, CANADA

By DONALD G. STANLEY
1135 N.Latrobe Avenue, Chicago 51, Illinois

About the first of May, 1949, I developed a severe case of wanderlust. For years I had wanted to go prospecting in some remote part of the North Woods possibly in Canada. I had traveled through much of the United States, Germany and Austria with the Army but had never been really free to pursue my favorite hobby which is prospecting and the study of geology. Since my discharge from the service I made plans for a trip which I would not soon forget.

Ideas from Rocks and Minerals

I searched through all my old copies of ROCKS AND MINERALS for ideas until an article on prospecting in Northern Ontario caught my eye. Ontario wasn't too far distant and it includes some of the most highly mineralized areas in all of Canada. Since I had no car in which to tour a large area, I decided to limit my explorations to the country surrounding the famous silver mining town of Cobalt. Later, by means of hitch hiking, I would tour the gold mines of the Porcupine and Kirkland Lake districts which were farther North.

I wrote to the Ontario Department of Mines and Resources requesting geological maps. The department was very helpful in supplying me with valuable information about the areas I planned to cover.

A Prospector Must be Experienced in Camping and Cooking His Own Meals

The following month I must have packed and re-packed my equipment a hundred times in eager anticipation of the day of departure which was to be Saturday, the 18th of June. All my gear was in order. Included were the following; a light insect proof tent, sleeping bag, cooking utensils, rod and reel. ax, hunting knife, compass, map case, prospector's hammer and other necessities. With provisions for five days it would make a compact field pack weighing about sixty pounds. Everything fit neatly into my duffle bag for the train ride.

I left Chicago Saturday morning and with great joy watched the crowded noisy city flit by my train window. Changed trains late that night at Toronto and boarded the Ontario Northland. Most of Sunday was spent enjoying the Northern scenery which is even more beautiful than the travel folders picture it to be.

Arrival in Cobalt

There is a large sign as you enter Cobalt which reads, "THIS IS THE TOWN OF COBALT—WHERE ALL THE SILVER COMES FROM."

I got off the train Sunday afternoon and after asking directions from some townspeople pitched camp along the wooded shores of Lake Sasaginaga on the outskirts of town. Cobalt draws its water supply from this lake which has scattered islands and fine fishing for lake trout and bass.

Through the hospitality of Mr. Nelson Pearce and his two sons, I was invited to stay at their cabin along the lake shore where Mr. Pearce looks after the pump house. I was grateful for the invitation since we had some foul weather the first week. The Pearces are very fine people and I will never forget their welcoming words, "When you walk through our front door, you're home."

I spent the next day in town visiting several people whom I had written to beforehand. They proved to be a great help and gave me a great deal of information concerning the mines and minerals.

A Mapping Expedition

Mr. Donald Russell, a dealer in mining equipment. gave me a series of Cobalt

minerals so that I would recognize them in the field. He had a fine collection including some gold specimens and a fountain pen base made of a polished vein section of almost pure silver. Mr. Russell later introduced me to Dr. Thompson, a government geologist, stationed at the Temiskaming Testing Laboratory in town. Dr. Thompson and three other associates, including Dan Atchinson, instructor at the Haileybury School of Mines, were conducting an intensive resurvey of the Cobalt mining district. Their explorations were uncovering much valuable data concerning structural geology and its relation to the ore deposits. They are using this information in preparing a finely detailed coutour-geologic map which is to replace the earlier obsolete editions.

I was extremely fortunate to be permitted to accompany Dr. Thompson's crew on this expedition for I gained some valuable knowledge of what goes into the making of a geological map. The geologists carried a light field pack for these wilderness excursions. Their equipment consisted of map cases, aerial photomaps, compasses and pocket transits, hammers, picks, notebooks, food and mosquito repellent. (In this country an outdoorsman would forget his head before he would forget his mosquito lotion). We travelled on foot over the ground which was shown in the aerial photos while the geologists filled in the details on a transparent sheet placed over the photo.

We hiked through dense woods. You could hear a man moving thirty or forty feet away but you couldn't see him. We climbed over rocky hills, cliffs and in the valleys through dark mosquito-ridden swamps. Samples were hammered off conspicuous outcrops of rock. A typewritten number on a piece of tape was stuck to each specimen. It was recorded in a notebook and kept for future study back at the lab. Taking a fresh sample from an outcrop and identifying it is necessary in order to determine the proper relationships of the different rock structures. The extent and positions of dikes of granite and diabase had to be determined. This was no easy job because they were partly buried beneath forest growth and overburden. You could hardly make out the contact of dike and wall-rock because of weathering and discoloration. It was difficult to tell whether huge rock masses were actual outcrops or merely large glacial boulders. Some of the boulders were as big as a house and half buried. It is not hard to believe these tons of rock were carried there by ice when we stop to consider that the glacier was a mile thick in places.

Large sections of the forest floor were traversed by long trenches dug many years ago. The miners dug ten sometimes twenty feet deep through the soil down to the bedrock in the hope of encountering a silver vein. The work must have been back-breaking since thousands of roots and boulders had to be excavated. The trenches are partly filled with the passing of thirty or more years and the falling of countless leaves. In the mad rush for silver and riches the early prospectors and miners kept no scientific record of the rock series which they dug into. Because of the lack of records and detailed information Dr. Thompson and his crew had nearly to start from scratch.

An Abandoned Prospector's Hut

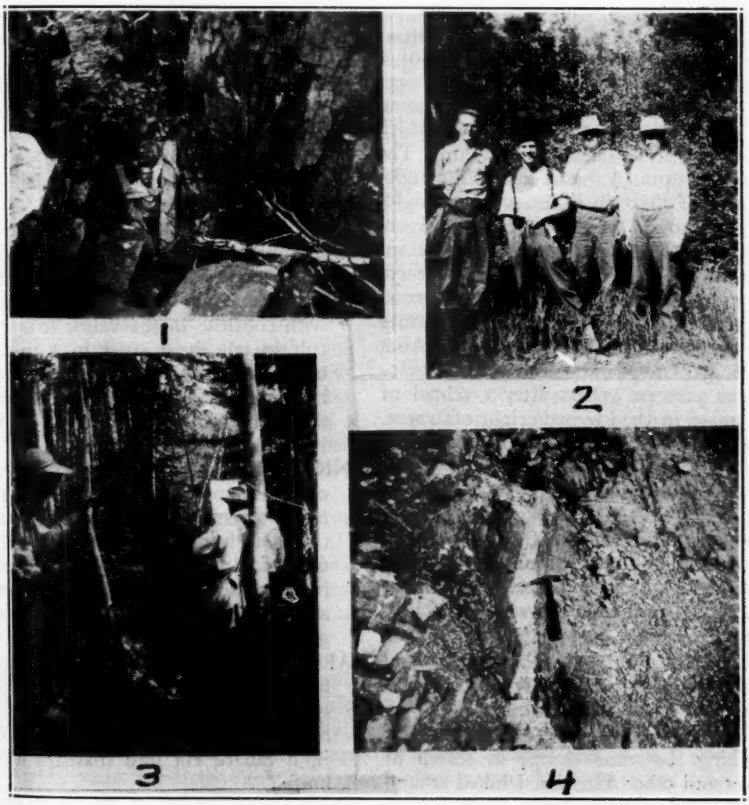
One very fine day we stopped and ate lunch under a spruce tree in a grassy clearing. At the center of the clearing stood an old deserted prospector's cabin, a crude affair made out of logs and corrugated metal siding. We entered with caution for fear a bear might have taken up residence in it which was very possible. I had heard some hair-raising tales about the bears in Ontario and wished for my high powered rifle. No bears, but I found out rather abruptly that the ceiling was low. The furniture was crude and hand-made and the rooms were small and dark. The place looked as though no one had lived in it for maybe thirty years. It was a decrepit shack but a godsend to a half frozen hunter or trapper lost in a blizzard at about fifty below zero. Outside the cabin I picked up a large piece of ore which was studded with small white metallic crystals of cobaltite. It was very heavy and may have been used as a doorstop.

These geologists who carried only a couple of sandwiches and a chocolate bar apiece were astounded at the size of my lunch and I don't blame them.

A Disappointment — One of Many During The Silver Rush

Somewhere, deep in the woods, we came across a vein of gray quartz about eighteen inches wide. It was faulted and fractured in places and a shaft was dug parallel to it. A pile of quartz and waste rock surrounded the opening of the pit. It might have been fifty or a hundred feet deep. We couldn't tell for sure but it took a long time for a pebble to strike bottom. It must have been heartbreaking to find such a promising looking vein to be barren of valuable minerals. However, there were the usual sulfides present in the quartz and in the wallrock. I collected some pyrite, galena, sphalerite, pyrrhotite and some crystallized marcasite concretions.

I had considered myself to be quite a good geologist until now but these fellows with their eagle-eyes noticed tiny details which I would have by-passed.



1—The writer in the test pit containing a narrow silver vein. The pit is about 60 feet deep. Note the conglomerate rock.
2—The writer, MacDonald, Dan Atchison, and Dr. Thompson. We just got out of the car and are preparing to enter the "bush".
3—We pause in the middle of nowhere as Dr. Thompson consults the map.
4—A typical barren calcite vein cutting Keewatin greenstone. Hammer points to vein.

Ancient Flows of Pillow Lava

Huge dark gray forbidding masses of lava rock loomed through breaks in the trees. Odd pillow-shaped designs, flow lines and green veinlets of epidote marked the uneven surface. The lava belonged to the Keewatin Series, a complex of igneous rocks formed at the very dawn of life on Earth. This series has been metamorphosed to a degree. The Keewatin rocks are hard and firm and do not fissure as readily as those of the Cobalt Series. This may explain why most of the mineral veins have been found in the Cobalt Series. Both series are Pre-Cambrian in age.

Faulting, Weathering and Metamorphism

Along the smooth rocky shore of a secluded lake, Mac, one of the younger student geologists, pointed out to me an excellent example of a quartz vein which had been offset laterally by faulting. The vein cut through metamorphosed conglomerate of the Cobalt Series. The conglomerate showed weathering by exfoliation. The rock fractures right through the included boulders instead of around them which, I believe, is the result of metamorphism. This is similar to the fracture of quartzite. For a second I forget about geology as I saw what was either a monstrous pike or a bass after a school of minnows in the lily pads right off shore. With an outburst of profanity, I realized I didn't bring my rod and reel.

The day was extremely hot. We encountered a deep crystal clear spring in the rock from which flowed icy cold water. I drank my fill of the delicious fluid and filled my canteen. There are many such springs in the woods and hills around Cobalt.

I spent many pleasant days in the field with Dr. Thompson's party and hope we have many more in the future.

I spent much of my time by myself combing the mine dumps in search of silver and other minerals. I hiked around isolated lakes looking for likely fishing spots. Mr. Pearce's dog was my faithful companion and followed me around like my own shadow. A refreshing swim in a wilderness lake usually followed a hard day of hiking and climbing and finally the long walk back home with a back breaking load of minerals in my pack. Incidentally this field pack of mine is an old and dependable friend. In Germany I carried rations in it to my girl who lived in a small Bavarian village. I have worn it on mountain climbing trips in the Bavarian Alps as well as on local trips back home.

Getting back to collecting, here is a description of the minerals which I have found after careful searching.

Ore Minerals

NATIVE SILVER—in the form of leaves wires and veinlets. Also found as hackly masses in cobalt and nickel ores and in quartz. The white crystalline leaf silver is very beautiful.

NATIVE BISMUTH—fairly large, light coppery-red crystals in white calcite and ore.

COBALTITE—sulfarsenide of cobalt. Found as small metallic crystals and crystalline masses.

SMALTITE-CHLOANTHITE— an isomorphous series. Smaltite is essentially cobalt arsenide while chloanthite is nickel arsenide. They occur intermixed with cobaltite in the veins. It is difficult to tell them apart in a piece of ore. Their color is white—metallic. I have several fine vein specimens of these, the shiny metallic vein contrasting with the dull dark wall rock.

NICCOLITE-BREITHAUPTITE — Another isomorphous series. Niccolite is nickel arsenide grading into breithauptite, nickel antimonide. These are both ores of nickel. They occur as lustrous, light copper red metallic masses, very attractive specimens when stained with green nickel bloom.

ARGENTITE—silver sulfide. Occurs as black metallic scales in white and gray quartz. It sometimes has an iridescent blue coating. Argentite is sectile, that is, it can be cut into shavings with a knife.

SKUTTERUDITE—cobalt arsenide. A rare mineral found as small tin-white shiny cubic crystals.

SAFFLORITE—cobalt diarsenide. Another rare mineral found as tin-white masses in ore.

RAMMELSBERGITE—essentially nickel diarsenide. Tin-white in color and massive in form.

Alteration Minerals

ERYTHRITE — "Cobalt Bloom" — hydrous cobalt arsenate. This is the most colorful mineral in Cobalt. Erythrite is a mineral of secondary origin resulting from the chemical alteration of various cobalt minerals. It is found as spectacular rose and peach colored crusts and stains. I was fortunate to find some good specimens of rare radiating crystals of this mineral.

The conspicuous color of this mineral on the surface gives away the location of rich veins to the prospector.

ANNABERGITE — "Nickel Bloom" — hydrous nickel arsenate. Chemically this mineral is similar to erythrite being of secondary origin. It occurs as beautiful apple green crusts and stains on weathered nickel minerals.

Gangue Minerals

In mining, the "gangue" is the worthless mineral or minerals in the ore body which accompanies the valuable minerals. At Cobalt these are almost absent in the richer parts of the veins.

CALCITE—found as white and pink cleavages. Forms many barren veins in the district. Found as small rhombohedral crystals in vugs. (A vug is a miner's term for an opening in a vein usually lined with well formed crystals).

DOLOMITE — strawberry colored cleavages with spots of smoky quartz.

QUARTZ—white and gray masses, some are smoky. Also forms many barren veins. In vugs and cavities found as gray prismatic crystals.

Common Sulfides

BORNITE & CHALCOPYRITE — both are sulfides of copper and iron. They occur as iridescent masses of reds, purples and blues. Chalcopyrite occurs in quartz veins as brassy-yellow masses.

PYRRHOTITE "Magnetic Pyrites"—ferrous sulfide. Occurs as attractive bronze metallic masses in white quartz and crystalline white calcite.

PYRITE—iron disulfide. Found as brilliant masses in wall rock and as well formed small crystals in white quartz.

MARCASITE—iron disulfide. Found as globular concretions in wall rock of a quartz vein.

GALENA—lead sulfide. Small grains in quartz.

SPHALERITE—zinc sulfide. Small grains and masses with quartz and calcite.

Galena and sphalerite are not common in this district.

A Contact — Metamorphic Mineral

An interesting occurrence in the Cobalt district.

ASBESTOS — an amphibole.

This mineral is found as fluffy-white fibers in small veins. The fibers separate easily like the commercial type. Another type found here is green and splintery. The asbestos occurs along the contact zones of the diabase with the surrounding rock.

Other Minerals

EPIDOTE—A complex silicate. Occurs as small veinlets and colorations in the pillow lava.

ACTINOLITE—an amphibole. Found as small green crystal prisms in narrow calcite veinlets in Keewatin greenstone.

FLINT—I was told that flint pebbles were imported from the Lake Superior area to be used as mill rock in crushing the ore. Some are perfectly round and a pile of them resembles cannon balls.

Diamond Drill Cores

Near an old weather beaten head frame along a lake shore, I found a pile of discarded diamond drill cores. Some show veinlets of asbestos where the drill passed near the contact zone. Diamond drilling in the district is expensive because of the hardness of the rock. It may run two to four dollars a foot. The fact that the rock is so hard and firm ranks the mines of Cobalt among the world's safest.

I picked up a rusty discarded drill bit. It is now cleaned and painted silver, an interesting paper weight in my den.

There are other minerals reported in this district which I have not found. They are dyscrasite, ruby silver, millerite, barite, fluorite and a few others. I may have some of the rarer species in a group which I have not identified as yet.

No doubt there will be a few readers who will plan to visit Cobalt next season. By all means do, you will meet some wonderful people and have the time of your life. But take my word for it, you will have to look hard to find good mineral specimens unless you can get permission to collect on the dumps of a working mine. The reasons for the scarcity are: since many mines became exhausted their dumps were re-milled to extract every trace of ore minerals, also because highgraders and collectors have picked them over for years.

Once while speaking to a nice looking girl in the town post office, I quite innocently made a blundering remark, "I sure would like to get a job as a "high-grader" in one of these mines. I hear they make some good money!" The post office was crowded with townspeople all familiar with mining terms. To my extreme embarassment, I was politely informed that a "high-grader" is a robber, a crook, a dishonest miner, who steal high-grade ore out of the mine in his lunch basket. When precious metals or gems are involved, the crime is almost as bad as piracy on the high seas! (Apologies to the many honest high-graders who buy the right to dig silver from the owner of a disused mine.)

A Most Unusual Grocery Store

Through the generosity of Bill Thomson, owner of Thomson's Food Mart, I was given the necessary materials to ship my specimens home in. Bill's store is located near the center of town and is erected around a disused silver mine complete with head frame. Bill is the only grocer in the world I know of who can take his customers through his store and down into a silver mine. He plans to give the hoisting machinery a complete overhaul and publicize the store as a tourist attraction. Mines of luck to him.

Other Activities

Many pleasant days were spent with Mr. Pearce's boys, Clarence and John. We fished in the turbulent Montreal River for wall-eyes and traded lies about other big fish we have caught.

By the way, have you ever tasted freshly caught bass fried to a golden brown in bacon grease over a campfire and then smeared with melted butter? Well you can have your fancy restaurants and expensive dishes. I'll take the North Woods, a campfire and the ants for company.

Here is a tip for you collectors who camp out and cook your own grub. Instead of throwing away your pan of bacon grease, fry a plain piece of bread in it. Then let a fried egg run over the top, add a dash of catsup and you have a tasty outdoor breakfast fit for a king.

A Typical Silver Occurrence

One of Mr. Pearce's boarders, another fellow named Bill, showed me to a small shaft where he obtained some nice leaf silver for his girl friend. It was a shallow open cut with a sixty foot shaft sunk along an inch wide vein of silver, cobalt and calcite.

A sheer drop, sharp slippery walls and a rickety weathered ladder combined to make it an unhealthy place for collectors. But that didn't stop an enthusiastic rockhound in quest of silver. I scrambled through the narrow opening of the pit and went partway down the shaky ladder. Sure enough! There was the narrow vertical pink vein with protruding leaves of silver!

After hammering away for a good fifteen minutes at the wall rock, I had a nice section of vein projecting. With a light sideward tap it loosened and I passed the glittering pieces up to Bill at the surface.

Puggy, our dog companion, must have wondered what there was in the dusty rocks that fascinated these strange humans.

This pit was an exploratory shaft dug to see if the vein would widen out. It didn't. There was not enough silver to mine at a profit so they gave it up. This is the case with many similar veins in the district.

A Natural Ice Box

Some of the larger disused pits are like refrigerators with last winter's snows and icy pools at their bottoms. They consist of deep open cuts with tunnels or drifts leading underground in all direc-

tions, wherever the veins may lead. The veins were out of my reach and it would have been perilous and foolhardy to go any deeper. A false step on the slick ice and no one would ever know what happened to you. Frogs and small animals which strayed over the edge of the pit were frozen to death at the bottom. What an odd sensation it was to climb out of that icy pit into the hot summer sunlight.

Richest Gold Mines in Canada

I spent two days touring Porcupine and Kirkland Lake mines. No collecting was done since the mines are closely guarded by the Canadian Government. No one is allowed to have native gold or radioactive ores in his possession without a special permit. I suppose collections for research or display purposes are exempt from this strict law.

The ride up to the Porcupine district at Timmins was very interesting. We crossed over the divide marking the Arctic Watershed. At this point all the rivers and streams flow Northward.

I was very surprised to find such thriving, modern cities like Kirkland Lake and Timmins up in the middle of nowhere. They have certainly sprouted up during their short history.

5—View of Lake Sasaginaga from the top of diabase sill. Pumphouse is shown. There has been some mining done on the nearest island.
6—The hammer lies on a ledge of a splintery green asbestos-like mineral. This is an open cut.
7—Arthur Wright and the writer up in the look-out tower about 90 feet above the summit of Mount Diabase.
8—"Puggy." I was doing my laundry in the pan in the foreground.

I was glad to return to Cobalt. I felt very much at home in this town. But, soon my Canadian trip would be drawing to a close and I would have to return to the revolting ugliness and noises of the big city.

History of Cobalt

Cobalt is a town with a population of about 2000 and is located about 330 miles north of Toronto in the Province of Ontario. It lies in the district of Temiskaming which is a paradise for outdoor people. The surrounding countryside consists of thousands of lakes, fast moving trout streams, rocky hills and woods which abound with game.

About the turn of the century this country was thought to be a barren wasteland of rocks and woods. In 1903, silver was discovered by accident during the construction of the Ontario Northland railroad. This railroad was being built in order to connect the rich farms of the Northern Clay Belt with the big cities to the South. While blasting the right of way through solid rock hills incredibly rich veins of silver were encountered, many of which intersected the surface. Huge leaves, broad plates and sponge like forms of almost pure native silver were commonplace. As soon as the find was verified by geologists, news of the strike spread like wildfire. This astonishing discovery attracted miners, prospectors and adventurers from all over the world. The town of Cobalt sprang up along the shores of a wilderness lake surrounded by stands of virgin timber which have long since vanished.

Cobalt prospered for 45 years and the mines of the district produced over 700 million ounces of refined silver. Due to a gradual exhaustion of many veins and a lowering of the price of silver, activity slowed down. Some of the mines are still in operation. A few are owned by American interests.

New veins are discovered from time to time. A recent picture in the Chicago Tribune shows a silver-cobalt vein, just discovered, which is as wide as a man's shoulders.

By-products mined with the silver include mainly nickel, cobalt and arsenic. New uses for the metal cobalt would bring a greater demand and possibly new prosperity for the town.

At present cobalt is used for making high grade steel alloys, alnico magnets, stellite cutting tools and chemicals. More recently cobalt alloys have been used for parts in jet plane engines. Cobalt alloys can withstand high temperatures.

The Geology of Cobalt

I was told by a mining geologist that the Cobalt district has a more complex series of rocks than any other region of its size in the world.

Besides the various minerals, there are many other specimens of geological interest to be found. A series of igneous, sedimentary and metamorphic rocks may be gathered by a person interested in petrology. Specimens showing vein structure, replacement of wallrock, faulting and slickensides, weathering and chemical alteration and contact metamorphism will add to the interest of any collection. I mention these for the benefit of other collectors like myself whose interest lies in the study of geology as a whole.

General Geological Cross-Section

Following is a cross-section of the region starting with the most recent deposits at the top. The oldest, the Keewatin or basement series, is at the bottom.

Glacial and Recent

Boulder clay, gravel, sand and bedded clay.

Niagaran

LIMESTONE with a small amount of sandstone and conglomerate at its base. This series occurs only in scattered patches which have escaped erosion.

Great Unconformity

Pre-Cambrian

DIABASE AND GABBRO. These igneous rocks cut through all the other precambrian series in the field forming dikes and sills. The fissures now occupied by the Cobalt silver ores in the lower Huronian were probably formed by the disturbance which accompanied the eruption of the diabase and gabbro.

Igneous Contact

MIDDLE HURONIAN—Lorrain arkose, quartzite and conglomerate.

Unconformity

LOWER HURONIAN (The Cobalt Series)—Greywacke, slate and quartzite, (The cobalt, nickel, arsenic and silver veins occur largely in this series). Conglomerate and breccia.

Great Unconformity

LAURENTIAN—Granite and syenite. These rocks are intrusive into the Keewatin, but not into the Lower Huronian.

Igneous Contact

KEEWATIN — An igneous complex consisting of greenstones, quartz, porphyries and other rocks. It has been more or less folded and disturbed.

A few of the cobalt-silver veins occur in it.

In general, the relations of the most important rocks may be summed up as follows: The Keewatin series is peneplained and overlaid by the Cobalt series. A sill of diabase at places about a thousand feet thick intrudes both these series lying near their contact.

The Ore Deposits

According to S. F. Emmons the ore deposits of Cobalt are of a remarkable nature and are utterly different from anything seen in the United States.

The silver-cobalt deposits are veins generally short and irregular. The veins are mostly narrow varying from a few inches to three feet wide although some are twenty feet or more in width.

The dip of the veins is approximately ninety degrees while their strike is in many directions. The depth varies but is, as a rule, not over two hundred feet.

Rich ore-bearing veins may be a few hundred feet in length pinching out at its extremities to form thin seams of barren calcite.

The veins, in general, lie near the Keewatin-Cobalt contact and also near the diabase sill.

Origin of the Veins

The veins were formed by filling fractures and replacement of the walls. The mineralized wallrock is mined as a unit along with the vein material itself. The deposits are primary and mesothermal. Mesothermal deposits are formed by deposition from hot solutions along fissures and cracks at moderate depths, temperatures and pressures. The mineral bearing solutions are derived from intrusive magmas. At Cobalt, the ore bearing solutions are presumed to have been derived from the intrusion of the diabase.

Composition of the Ore

The ore carries silver, cobalt, nickel, arsenic and bismuth. The principal minerals are cobaltite, smaltite, niccolite, argentite, native silver and dyscrasite. There are many rare species including a small percentage of gold per ton. Some of the ore carries as much as three to four thousand ounces of silver per ton.

Pyrite, galena, sphalerite and other common sulfides are occasionally found in the wallrock but constitute an insignificant part of the veins themselves. The gangue is quartz, calcite and dolomite as previously described.

Prospecting and Mining Methods

Prospecting for the veins is done by several methods such as trenching, drilling and by washing away the overburden with a powerful jet of water. Many acres are laid bare down to the bed rock around Cobalt by this latter method.

I'm not very familiar with mining engineering but in general terms the mining of the ore is done by means of open cuts, tunneling and drifting. Power is a hydraulic system which is piped to the various mines from a central source.

9—"The ice pit". An open cut with tunnels leading under ground.

In Conclusion

In closing I would like to mention an interesting climb up Mount Diabase where we spent an enjoyable afternoon with Arthur Wright, a fire ranger in the lookout tower. There we enjoyed a magnificent view of the surrounding country and could see across Lake Temiskaming into the Province of Quebec. We signed the tower register and I noticed the signature of a previous visitor who added, "Please excuse Alfred he was afraid to come up."

I can never be grateful enough to the many fine people in Cobalt who helped to make my trip an enjoyable one and this article possible. If you are ever in Cobalt, be sure to visit:

The Temiskaming Testing Laboratory
Thomson's Food Mart
Broskos Repair Shop
Larry Stadelman's Book Store and
The Herberts of Herbert Fuels Ltd.

There are many others I would like to mention but space does not permit.

References

Principles of Economic Geology—Emmons
Types of Ore Deposits—Bain
Various maps and reports of the Department of mines and resources.

WORLD'S LARGEST METEOR CRATER FOUND IN CANADA

In the far northern barren lands of the Ungava area, in the Province of Quebec, Canada (near Hudson Strait), the world's largest meteor crater was discovered in July, 1950, by a scientific expedition from Toronto.

The expedition party of six was headed by Dr. V. Ben Meen, director of the Royal Ontario Museum of Geology and Mineralogy (Toronto, Canada). Dr. Meen says the crater is the 8th wonder of the world.

The discovery was announced by the *Globe and Mail*, Toronto, Canada, in its issue of Mon. Aug. 7, 1950, in a copyrighted story. Ken W. MacTaggert, *Globe and Mail* staff writer, who accompanied the expedition, and who wrote the story, said the newly discovered crater is four or five times larger than the famous Meteor Crater of Arizona which has been considered the world's largest and which is about 4,000 feet in diameter. The Quebec crater is cone-shaped and rises to 550 feet above the tundra-covered plains that extend 30 miles or more in every direction. It is 2½ miles from crest to crest. Inside the crater lies a lake 2 miles wide and covered with ice that was 3 feet thick on July 26.

Some kind friend in Toronto sent ROCKS AND MINERALS a copy of the above issue whose long and interesting story was illustrated with 7 nice photos.

Miss Burwell Wins Insignia Contest

Mary Elizabeth Burwell, 960 Grant, Denver Colorado, was voted the winner in the national insignia contest sponsored by the American Federation of Mineralogical Societies. So many excellent drawings were submitted from all parts of the country that the final decision had to be carried over to the meeting of the Delegates at the Milwaukee convention.

Miss Burwell is a member of the Colorado Mineral Society and the designer of its emblem, which was similarly selected in open competition a few years ago. Her latest drawing was judged as best showing the scope and purposes of the Federation. It includes a map of North American, the name of the organization, the tools of the collector (hammer and pick), the books he reads, and the crystals he finds and cuts.

The Judges were Mrs. Dorothy Craig, representing the California Federation; Mrs. Verah Landon, of the Northwest Federation; and Chester R. Howard, of the Rocky Mountain Federation. The Midwest Federation was not represented because it acted as host to the convention. Prof. Richard M. Pearl managed the contest and Herbert F. Grand-Girard handled the publicity.

Frank Morse Featured In American Magazine

A picture-story about Frank Morse, founder of the unique Gem Village in Bayfield, Colo., was included in the "Interesting People" section (p. 62) of the August, 1950, issue of *The American Magazine*.

Mr. Morse is one of the West's most noted rockhounds with friends everywhere. Beyond a doubt these friends will want to obtain a copy of the above issue, if they do not already possess one. So, if your local news stand is out of the August, 1950, issue, you may get a copy by ordering direct from *The American Magazine*. 640 5th Ave., New York 19, N. Y. (Price 25c plus 10c for postage).

THE SCARLET COPPER MINE, N. C.

By C. HENRY KING

Box 109, Franklinville, N. C.

The Scarlet Copper Mine, alternately known as the Thorne Mine (1), is a small working, now idle. It is still considered a high grade copper-zinc deposit and thus has possibilities of being reopened.

Location of the mine is on the northern outskirts of Asheboro, the county seat of Randolph County, N. C. It may be reached by going north from Asheboro on U. S. Highway 220 to a small business area just beyond the junction of U. S. 220 with N. C. 49. A dirt road going a few blocks west from this area leads to the mining property.

The History and records of production for this underground working are apparently lost, but it is known that it was operated at irregular interva's from just after the Spanish-American War to events preceeding World War 1—a sixteen year period—probably corresponding to 1899 to 1915.

General Geology of the area is the Carolina Slate Belt. Specific geology of the mine has been mapped by the U. S. Bureau of Mines (2) and is on record as a granite-mylonite and epidosite contact.

Present Day Conditions of the Scarlet Mine are two caved-in shafts, one open shaft with hoist housing, a supply shack, and a small dump which still contains some high grade ore.

For Collectors who still enjoy finding common minerals, this mine will afford several varieties of minerals in good specimens. On March 26, 1949, the author and his cronies, Mr. A. T. Saunders and Ralph J. McDonald, made an initial visit and were surprised to find an abundance of pyrolusite dendrites scattered attractively over the disturbed country rock. It was the first time the author had ever come across dendrites in the field. Mr. Saunders, who had noted such tree-like markings on various rocks during his many years of prospecting for gold, was elated to finally learn it was pyrolusite and that the dendritic form was a characteristic occurrence. The find delighted Mr. McDonald, too, for as a beginner in mineral collecting he had neither read about nor seen dendrites previously. Other minerals collected on this date are listed below with those reported as being found at the mine.

Bornite: As dark blue masses. Very abundant.

Chalcopyrite: Main ore of the mine. In masses.

Malachite: As green crusts occurring on above minerals and probably an alteration of same.

Pyrite: Masses intermingled with copper ores.

Pyrolusite: As dendrites. Excellent specimens. Most abundant around perimeter of mine.

Quartz: Milky masses mixed with other minerals. Some stained green.

Sphalerite: Secondary ore of the mine. Reported by U. S. Bureau Mines (2).

Other Minerals revealed by assay, sampling, and bore hole checks by the Bureau of Mines (2) were: gold, silver lead in very low amounts; epidote, biotite, chlorite, actinolite, and feldspar as components of rocks drilled.

Literature about the mine was nonexistent at the time the author visited and collected at the mine, but several months thereafter (July 1949) a news release (3) stated that the mine had been investigated and a report of the findings was now available. This was the report noted herein as reference 2. It was a timely publication in that it provided additional notes just when the author was preparing this article.

References

1—News Item: Thorne Mine may reopen. *Courier-Tribune,* Asheboro, N. C. 1948.

2—The Scarlet Copper Mine. Report of the Investigations 4492. U.S. Bureau of Mines, Washington, D. C., July, 1949.

3—News Item: Randolph Copper Mine investigated. *Greensboro Daily News,* Greensboro, N. C. July 12, 1949.

COLLECTING IN NEW ENGLAND

By VINCENT GIORDANO
29 Cross Street, West Orange, New Jersey

On Sunday morning, July 2nd, 1950, a small group of Rock Hounds, all members of the Newark Mineralogical Society, left Newark, New Jersey, and headed north for a week's collecting mostly in Oxford Co., Maine. Included in the group were Mr. and Mrs. Philip Lum and their daughter Sylvia, Mr. and Mrs. Wilfred Welsh, Miss Phyllis Portington, Arthur Morison, Paul Kellinghausen, Albert White, President of our Society and the writer.

Our itinerary included a stop at the Lane quarries in Westfield, Massachusetts, but we evidently chose the wrong time as good specimens were not to be found. We decided to visit the Schortmann brothers, Mineral dealers, in Easthampton, Massachusetts, and spent an hour or so viewing their many fine minerals. Needless to say, many of them found new homes in our various collections.

We then headed for Webster Lake in Franklin, New Hampshire, where we had reservations for the night. On Monday morning we again headed north and called on our friend and fellow-member, Mr. Edwin Judd and his wife, who have a summer home on Lake Winnipesaukee, in New Hampshire. At last we were on our way to the Snow Falls Cabins in West Paris, Maine, which was to be our headquarters. On arriving there we were greeted by the rest of our party who had left a day or two earlier. It included Mr. and Mrs. Gavin Taylor, Leonard Morgan, Miss Lucy S. DallaValle and Mr. E. J. Talamini.

Tuesday morning we visited Mt. Newry, Maine, and spent the entire day there.

I had heard reports on the breath taking climb to the top of the mountain and I wish to concur in these reports. I felt as Peary must have felt when he reached the North Pole.

Among the minerals collected were: Tourmaline in color and some black, Lepidolite, Triphylite, Muscovite, Spodumene, Amblygonite.

This is part of our group at foot of Mt. Marie, Paris, Maine. 1—Albert S. White; 2—Leonard A. Morgan;3—Philip Lum; 4—Arthur Morison; 5—Wilfred Welsh; 6—Paul G. Kellinghausen; 7—Neil Jorgensen; 8—Mrs. Gavin P. Taylor; 9—Mrs. Dorothy Lum; 10—Miss Sylvia Lum; 11—Mrs. Mary Welsh; 12—Miss Phyllis Portington; 13—Vincent Giordano.
Photo by Galvin P. Taylor

Wednesday was spent at the Wardwell Quarry in Albany, Maine. I believe we found our most interesting specimens at this place. We met Mr. Lawrence Sampter whom I only knew from reading his articles in *Rocks and Minerals*.

Some Beryl XLS were found, one about six inches long in Quartz Matrix. Mrs. Welsh was the lucky finder. Mr. Morgan found a green crystal. We also collected Rose Quartz, Muscovite XLS, Biotite, Autunite and Manganapatite XLS. The last two minerals showed beautiful color under the Mineralight. Some specimens had both minerals. Near the Wardwell quarry is a Garnet pit where Garnets, some as large as a hen's egg, were found. We visited the quarry at night with a portable Mineralight and collected some specimens of Autunite and Manganapatite.

Thursday morning we visited Perham's Mineral store and met Mr. and Mrs. Neil Wintringham. Mr. Wintringham is President of the New Jersey Mineralogical Society.

Our next stop was at Noyes Mt. in Greenwood, Maine, where we met Mr. Nestor Tamminen and his family. Mr. Tamminen inviteded us to see his collection of Quartz XLS that were found in a pocket on his property.

Among the minerals were: Cleavelandite, Quartz XLS, Lepidolite, purple Apatite XLS, Muscovite, Cookeite and Cassiterite.

Mr. Neil Jorgensen of Haddonfield, New Jersey, joined us on this trip and stayed with us the following day. Mr. Jorgensen is spending the summer at Buckfield, Maine.

Friday we made short stops at the Bennett Quarry in Buckfield, Mt. Mica and Mt. Marie in Paris, all in Maine. Some of the minerals collected were: Black Tourmaline, Lepidolite, Dentrites and Montmorillonite.

Saturday, on our way home, we visited the Palermo Mine, in No. Groton, New Hampshire.

Collected: Triphylite, Vivianite, Dentrites, Black Tourmaline XLS and Montmorillonite. Beryl was also seen.

Stayed the night again at Webster Lake and Sunday morning we headed for home, thus ending a wonderful week. I wish to say that it was my extreme pleasure to be with such a fine group of people. I would also like to mention that Mr. and Mrs. Green who operate the Snow Falls Cabins are to be commended on the excellent service and hospitality that they extended to us.

I am looking forward to another trip next summer.

MARSHALL PLAN TO AID BELGIAN CONGO TIN MINES

Tin from the Belgian Congo, Africa, will be added to the U. S. Government stockpile with the help of $1,700,000 in Marshall Plan funds, the Economic Cooperation Administration announced on July 1, 1950.

Under a contract, recently signed by ECA with Compagnie Geologique et Minere des Ingenieurs et Industrial Belges, the dollars will be spent for mining machinery to be purchased in the United States. The Belgian firm will repay ECA in tin to be added to the U. S. stockpile.

The contract calls for the development of mines in the Manono area, about 400 miles north of Elizabethville, in the eastern section of the Congo. The mines also produce columbite and tantalite. During World War II, the Congo was the only supplier of high grade tin ore available outside Japanese-held areas in the Far East.

ECA pointed out that the development of the tin mines not only will make available materials in short supply in the U.S., but will aid the Belgian economy by increasing the capacity of a dollar-earning export, and will contribute to the progress of one of the under-developed areas of the world.

The Manono deposits have been worked by the Belgian company since 1919, but mechanization of the mines was not started until 1932.

GIANT FIELD TRIP IN NEVADA

OCTOBER 7 - 8, 1950

The mineral and gem enthusiasts of Las Vegas and Boulder City, (both in Nevada) who are associated under the name of the Clark County Gem Collectors, Inc., have had a spring and summer full of activities with their monthly field trips and fixed monthly combined lecture and business meeting which is held at Anna Parks' Museum in Las Vegas the second Tuesday of each month.

The Board of Directors decided that in view of the many shows held by the various clubs throughout the West, to sponsor a new idea and to invite all rockhounds to a giant field trip, at which time will be the initial gem hunting of the particular area, having at the present time only been scouted by three of the club members, who are pledged to keep the location secret until the awaited day.

The accompanying letter and schedule of events has gone out to approximately forty mineral societies in Southern California and each of the clubs in Nevada. Advance indications lead us to believe that one thousand persons in attendance may be a conservative estimate.

All collectors and rock hounds who find it convenient to be in this locality at the time may consider themselves invited.

Fellow Mineralogists:

Clark County Gem Collectors, Inc., extend a cordial invitation to the members of your Club to participate with them in an overnight camp and field trip to a virgin flower agate location the weekend of October seventh and eighth, 1950.

Through the courtesy of George F. Baggley, Superintendent of the Lake Mead National Recreational Area, U. S. Department of Interior, we have reserved the use of Boulder Beach and camp ground with its adequate sanitary facilities and special accommodations. This choice of campsite and bathing beach suggests the possibility of a swim in famous Lake Mead on your return from the newly found agate bed.

There will be ample opportunity for members of this mass field trip to take a guided tour of Hoover Dam and attend a color slide lecture by Russell K. Grater, Chief Park Naturalist, whose subject will be "The Ancient Landscapes of the Lake Mead Region," followed by square dance music around the campfire—or if your tastes dictate night life, Las Vegas is about twenty miles distant.

You are welcome, if you wish, to make this one of the official field trips of your Club, or to simply advise your members so that all who wish may attend. However, we would appreciate information by October first, through your Club secretary, as to the approximate number who expect to come.

All who attend are requested to check in and sign the register at the Park Ranger Station located at the entrance to Boulder Beach, to be assigned a campsite.

Consult your favorite mineral publication for a map of directions to the campsite, which has been prepared for us through the courtesy of the Nevada State Highway Department.

It will be our great pleasure to endeavor to make this a memorable occasion for all.

Sincerely,

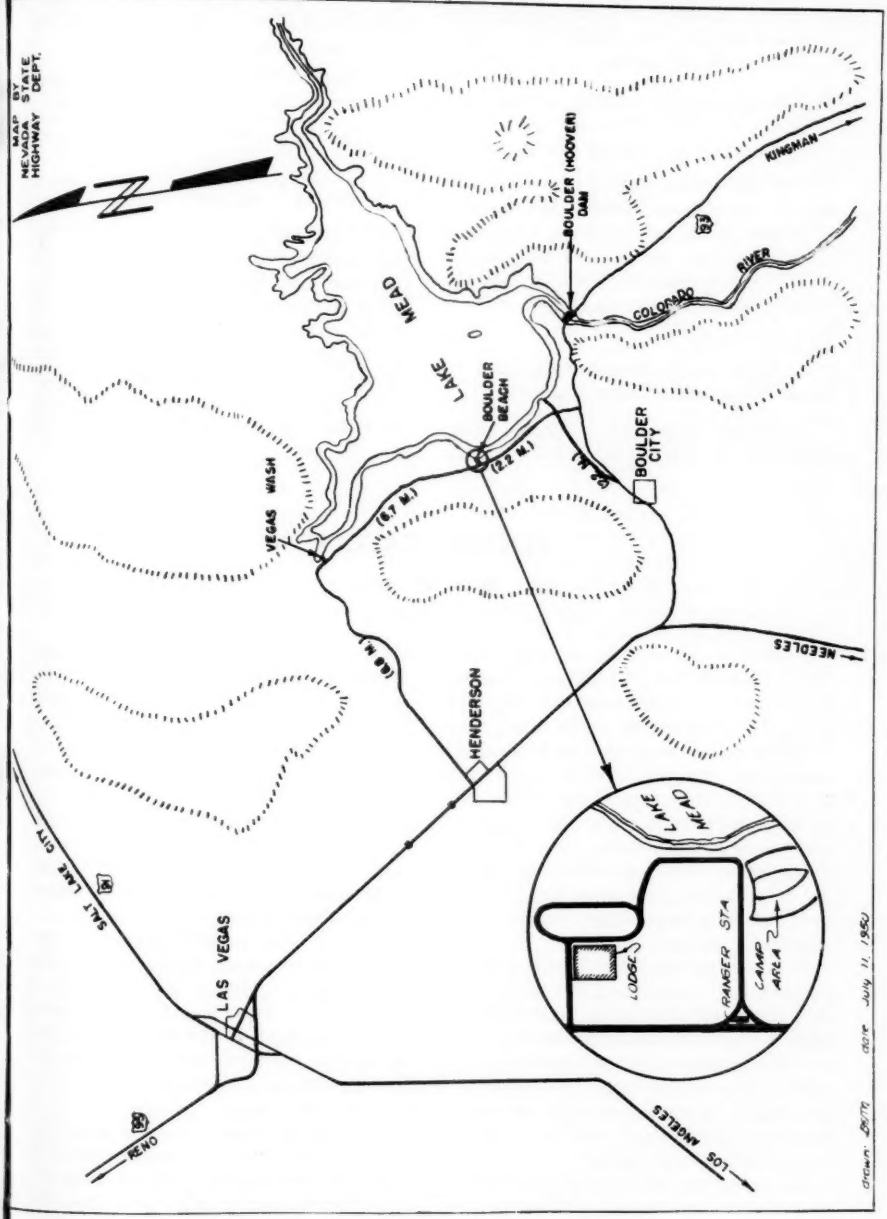
Paul O. Drury,
Publicity Director

July 12, 1950

Schedule of Events

SATURDAY, OCTOBER 7th:

8 a.m.: Field trip party leaves the gate, located at the eastern end of Hoover Dam at the top of the hill, on the Arizona side, for the field trip. Late comers may proceed southward on the Kingman Highway No. 93 and turn in at the sign for the field location which will be erected by the guides when they take the 8 o'clock party in. Carry lunch and adequate water. Return from the flower agate location at your convenience. Guide service maintained for tours through Hoover Dam, leaving approximately every ten minutes.



Map showing location of Boulder Beach, Nevada.

7:30 p.m.: Lecture, Kodachrome illustrated, "Ancient Landscapes of the Lake Mead Region" by Russell K. Grater, Chief Park Naturalist.

8 p.m.: Campfire lighting by Donal J. Jolley, Chief Park Ranger, and square dance music by western cowboy band.

SUNDAY, OCTOBER 8th:

8 a.m.: Return to flower agate location if you desire, or if sufficient demand, our President, Bill Brown, will lead an informal group to the Park Onyx Field, or the Green Jasper location.

PEASE NOTE:

1. Check in at Ranger Station on arrival; Rangers allot camp space.

2. Boulder Beach is a designated swimming area by the National Park Service. Do not forget to bring your swim suits.

3. Those who wish to arrive Friday night may do so.

4. Park Service facilities will arrange for ample cooking firewood.

5. Drinking water is piped to the campsite.

6. First Aid will be available.

7. Lake Mead Lodge is located approximately one-fourth mile from the campsite and has facilities for seating about one hundred persons at a time for meals. A taproom is also available, and very limited motel accommodations. Additional motel accommodations are available for a few in Boulder City (5 miles) for those who are unable to bring full camping gear.

SENECA CALCITE

By K. SPIROFF

Michigan Tech, Houghton, Michigan

During a recent visit to the Seneca No. 2 Shaft in Keweenaw County, Michigan, the writer noticed on 19th level, 750 feet north of the shaft, considerable water dripping. On the hanging wall there were small white stalactites, and on the floor there were puddles containing white pebbles. In the illumination of the electric lamp, "the nest-like" clean pebbles were in striking contrast to the surrounding gray material. Many of these pebbles were loose; others were cemented together.

A study revealed the material to be fragments of rock coated by calcite. The material varied from fine (cryptocrystalline) to beautiful micromounts, the most abundant crystals showing e(0112) and m(1011) faces. The calcite rhombohedral cleavage flashes could be easily discerned. Elsewhere material of similar type has been called "Cave pearls."

What makes this material worthy of note is the fact that the calcite is of recent origin in a copper mine having lava wall rocks of ancient origin. The Seneca is on the Kearsarge lode (Keweenawan-Pre-Cambrian), which has a strike of N 40°E and a dip of 35° to the northwest.

The writer has previously collected similar material from the Naumkeag Mine adit, Houghton, Michigan. U. S. Geological Survey Professional Paper No. 144 (The Copper Deposits of Michigan) page 59, states that "Calcite is formed in the present mine workings where water is dripping in the upper levels."

There is also a difference in the appearance of specimens from the two localities. At the Naumkeag the pebbles were smoother and more pearly in appearance than were those at the Seneca, and the crystalline material was more of the "church steeple" clusters that is v(2131) faces predominating.

The writer would like to have the present location and occurrence recorded, as it is of interest that calcite is being deposited at the present time in mine openings of considerable depth in Keweenawan lava flows.

SPECIALIZED COLLECTING BERYLLIUM MINERALS

By E. LAWRENCE SAMPTER
49 West 45th St., New York 19, N. Y.

(Condensed from a more detailed article which, when printed, will be supplied gladly, free on request, by the author.)

Mineral collecting has become such an active hobby and as the field is so large and varied, it is suggested that the average collector specialize in some specific branch of the science. Then, after passing the beginner's stage of general collecting, he can concentrate his conversance with mineralogy, become an expert in his chosen category and instead of having a haphazard accumulation of rocks, crystals, or Dana numbers, accumulate an outstanding and representative collection of selective minerals.

Some well known collectors, who do specialize, aside from their general collection, find great interest in and are known for their fine assemblage of garnets, rare-earth minerals, quartz, zeolites, simulations, cabochons, gem stones, locality collections and others.

There should be a good reason for choosing a specialty, such as one's geographic locality, finances, particular interests, or ability to properly house and display one's collection.

In my case, beryllium minerals were chosen. The reasons for this are the timely and strategic interest in the metal since the war, as well as the fact that most of my collecting activities and time, are confined to pegmatite locations, where these specimens can most frequently be found. Items not in my hunting grounds can be obtained by trading, or by purchase from reputable mineral dealers.

Most of the beryllium minerals are very rare and continued search for a missing specimen lends zest to the hobby. Constant addition of pieces, from different sources of the same mineral, also keeps a specialized collection perpetually alive. As there are different characteristics of the same mineral, from different quarries, so the acquisition of the same mineral from various quarries, can also be of great interest to the serious student of mineralogy.

This is not planned as a too detailed technical article, but I include a few facts about beryllium metal and its minerals, uses, etc., as being of interest to a l serious collectors.

Dana says that the name "beryl" is of ancient origin, derived from the Greek word, which was applied to green gem stones.

Beryllium Discovered by Vauquelin

The discovery of beryllium—the metal (Be) resulted from Abbe Rene Just Haüy (1743-1822) noting the similarity of beryl and emerald. Louis Nicolas Vauquelin (1763-1839), a Frenchman, identified beryllium in 1797 (and it was publicly announced, in Paris, in 1798.) He analyzed beryl and emeralds and found them identical, each containing the "new earth," which he named "glucina" because its salts are sweet to the taste.

Beryllium was first isolated by Wohler & Bussy, independently in 1828. The metal was first prepared pure by the electrolytic process in 1898, by Lebeau. The delay in identifying beryllium was due to its great chemical similarity to a'uminum and the great difficulty of its chemical separation. As the weight of 4BeO happens to equal Al_2O_3, beryllium was overlooked and taken for aluminum, which caused many incomplete and inaccurate chemical analyses of its minerals.

The name "beryllium" was only made official by the commission on inorganic nomenclature of the International Union of Chemistry at a meeting held in Amsterdam, Holland, with representatives of 30 nations present, in 1949. While the name has been used for many years, glucinium was still the official name of element No. 4 until this year.

Pure beryllium metal is hard and silvery gray. It has a metallic luster, belongs to the holohedral division of the hexagonal system, with axis relation of

A:C=1:5802 and melts at about 1280°C. Be evaporates at 1450°C. and is a bivalent element. It is brittle, becoming ductile at high temperature, has a hardness of 6-7, specific gravity of 1.73-1.85 and an atomic weight of 9.2. Beryllium is the fourth lightest element and occurs as 0.0005% of the earth's crust; a position between tin and arsenic. It is never found free in nature. Pure beryllium metal is the only stable light metal with a high melting point and has a great affinity for oxygen, nitrogen, sulphur and carbon at elevated temperatures. It is extremely transparent to X-rays. It is an excellent sound transmitter—twice the conductivity of aluminum, or steel.

Some Uses for Beryllium

Due to its various characteristics, beryllium has been one of the rare elements of vital importance, which helped to win the last war and is still one of the most strategic elements today.

Prof. Fermi found out that alpha-rays, from radon, liberate neutrons to produce radioactive substances, which emit Beta-rays (negative electrons). So beryllium is used in atomic bomb work. It is also used for windows of X-ray tubes, as it is more transparent to long wave lengths of these rays, than glass.

About a 2% alloy with copper makes a very hard metal, which is non-magnetic, corrosive resistant and fatigue enduring.

The American Optical Company make a new glass with beryllium. The Elgin Watch Company use its copper alloy, with 8 other elements, for springs. A salt of Be also gives a striking white fluorescent light. The metal retains its polish better than aluminum.

There has been considerable publicity given recently, by newspapers, the radio and "Consumer's Research Bulletin" about the alarming hazard created by broken fluorescent light tubes. While the beryllium salt in these tubes is used to make an excellent visible light, this salt is very poisonous if inhaled, or if it enters the skin through a cut. It forms tumors, which are deadly, in the lungs and prevents cuts from healing, without surgery. Old light tubes should be broken and disposed of under water. A phosphor, other than beryllium, will soon be used to stop this risk of poisoning created by broken tubes.

The American Brass Company in Waterbury, Conn., first used beryllium commercially, as an alloy with copper, in 1932 and the Brush Beryllium Company started making beryllium alloys, on a large scale, in 1935, when beryllium metal, as a curiosity, was priced at $200 a pound.

It has been stated that production of beryllium alloys has been one of the most difficult assignments ever given to chemists and the process of separating beryllium for its various practical uses is complicated and expensive. Details of these processes can be obtained from recent chemical text books and the many excellent papers of the Beryllium Corporation of Reading, Pa., and the Brush Beryllium Company of Cleveland, Ohio.

Beryllium can be obtained commercially as a pure metal and as an oxide, sulphate, nitrate, fluoride, etc. Alloys with aluminum, nickel, copper and other metals are also available now and all have their specific advantages, over those without the beryllium contents.

Beryllium copper is the most used, due to its excellent hardness, high electrical and thermal conductivity, unusual resistance to fatigue and corrosion and excellent properties for casting. It is readily machinable, non-magnetic and anti-sparking.

One isotope of Be has been found so far. J. M. Lockyer found Be lines in the solar spectrum in 1878, Beryllium metal was made subject to export control on November 27, 1946.

BeO has a melting point of 2570°C. and is an excellent electrical insulator. At high temperatures it has unusual resistance to thermal shock and has a very high thermal conductivity.

Beryl Chief Source of Beryllium

The chief source of beryllium today is the mineral beryl ($2BeO.\ Al_2O_3.\ 6SiO_2$). There are no beryl mines, but it is generally found in pegmatic veins, as a by-product of feldspar and mica mining and is generally a very small, unpredictable part of such pegmatite loca-

tions. In the Urals and in Austria, beryl is found in mica schist. It is found in sixteen of our States and in South Africa, Brazil, Argentine, India, England, Canada, Madagascar, Russia, Ireland, Austria and Colombia.

Emerald Mentioned in the Bible

In the Bible the emerald (green beryl) was called *Smaragd* and occupied fourth place in the jeweled breast-plate of the high priest. Theophrastus and Pliny wrote about emeralds and Pliny referred to beryllus "like emerald."

Ancient Emerald Mine in Egypt

Cleopatra's emerald mines of Jebel Sikait, Etbai, near the shores of the Red Sea in upper Egypt, were worked for over 2000 years. They were recently reported as having been worked and emeralds were found there again.

Emerald Lens Used by Nero

Nero is reputed to have used a clear emerald for a monocle, as so ably illustrated in the ad of the Univis Lens Company of Dayton, Ohio. It shows him at his Arena viewing, through his emerald lens, the agonies of a beautiful Christian girl martyr, being fed to the lions for Nero's amusement.

Beryl and "smaragd," or emerald, were considered two species, until the time of Haüy, as stated above.

Emeralds (green beryl-color due to impurities of chromium) are the high point in gem values.

Muzo, Colombia, Source of Fine Emeralds

The flood of emeralds in Europe in the sixteenth century was due to the Spanish, who took all of this treasured wealth of these gems from the Incas, who would never reveal their source, even under torture. Muzo, where these emeralds came from in Colombia, was rediscovered, by accident in 1558. The emeralds occur there in veins in black, fine grained carbonaceous, crystalline limestone.

Talismanic Uses of Emeralds

Emeralds were employed as an antidote for poisons, poisoned wounds and demons and were supposed to cure fevers and epilepsy. Theophrastus in 300 B. C. said that emeralds relieved the eye. Emeralds worn over the abdomen or held in the mouth were supposed to cure dysentery as late as 1603, in Spain and Germany.

Pselus said, in 1745, that emeralds cured leprosy and checked hemorrhages, if taken powdered, in water. Hindos used emeralds in the 13th century as a good laxative and to cure dysentery and stimulate appetite. Teifashi (1242) said that emeralds cured haemoptysis, gastric troubles and kept away venomous creatures and demons. Egyptians used emeralds as amulets up to 2000 B. C.

Emeralds have been noted as the symbolic signs for St. John, the evangelist: the zodiacal gem for Cancer, or Sagittarius; the planet Venus and Mercury; for kindness and goodness; as the stone of the month for May; the hour of the day for 2 P. M.; the 55th wedding anniversary the feminine name—Elizabeth and the masculine name—Edmund.

Beryl has been called the symbol for St. Thomas; the zodiacal gem for Venus and Mars; the stone for March; the gem for 3 P. M.; the stone for Bertha and the masculine name Bernard. Beryl was supposed to banish fear; help against foes in battle, render wearer unconquerable; make the wearer amiable and to cure laziness. It was also worn as a lucky amulet by Greek sailors in ancient times.

According to some legends the emerald stands for "success in love" and the aquamarine is the birthstone for August and symbolizes "felicity."

Synthetic Emerald Now Made

In the January 8, 1949, issue of "Colliers," appears a popular article about Mr. Carroll Chatham of San Francisco. He has recently succeeded in producing the most perfect synthetic emeralds, that retails for about $90 a carat. Nature's emeralds sell for from 10c a pound to over $1000 a carat, according to clarity, color and size.

Beryl Prices and Production

Beryl—the beryllium, aluminate silicate—contains from 10 to 14% of BeO, the form in which Be is generally used and according to which BeO content, its market value is based. One ton of beryl contains about 240 pounds of BeO.

Beryl, not so long ago, was valued at $30 a ton for 10% BeO minimum and

$35 a ton, for 12% BeO. The price rose to $150 a ton for 12% BeO in 1946. It is now over $300 a ton and will probably bring a higher price soon, due to its great scarcity and increased demand for war and commerce. I know of one shipment of about 20 tons that sold for $700 a ton and another shipment that brought $1000 a ton due to the high BeO content. As a result of this price beryl has now become the "pay-dirt" in some pegmatites with the feldspar going into the dumps.

The U. S. A. produced only about 100 tons a year and imported 146 tons in 1938 and 459 tons in 1939. The world's entire output of beryl was about 2500 tons in 1941 and 6000 tons in 1943 and its present output is still far below the demand. In one Colorado mine only one ton of beryl was produced to 30 tons of feldspar.

The United States mined 388 short tons of beryl in 1944 and 100 tons in 1946. New Hampshire mined 5 tons and South Dakota 95. In 1946 the U. S. used 1013 short tons of beryl and 1738 tons in 1945. In 1946 the U. S. imported beryl from Argentine—53 tons, Australia —20 tons, Brazil—906 tons, India—119 tons.

France has the only Beryllium refinery outside of the United States and the French get their beryl from Germany and Madagascar. India put an embargo on beryl in 1946. In 1944 Korea produced 60 tons of beryl.

Beryl Sometimes Found in Enormous Crystals

Beryl comes in hexagonal crystals, from microscopic sizes to known individual crystals of 30 tons. Very large crystals—up to several tons in weight—have been mined in South Dakota and at the Bumpus mine, near Bethel, in Oxford County, Maine. Large crystals can still be seen there, in the walls of the old quarry, where mining started again in the summer of 1949. In front of the South entrance to the American Museum of Natural History, in New York City, stand two pieces of one of the very large Bumpus quarry crystals. They were placed there, through the generosity of the late Mr. J. P. Morgan, the great benefactor of the Museum's collection of minerals.

A beryl crystal was photographed in the Black Hills of South Dakota, in about 1930, eight feet in diameter and estimated to weigh about 30 tons. Two known crystals from Grafton, N. H., weighed over 2900 and 1076 pounds each.

Beryl has been found in rare 18 sided crystals too, in Maine, New Hampshire and Finland. No twin crystals have been definitely identified as yet, but the University of Toronto, in Canada, and the American Museum of Natural History each have a specimen, which might be a twin if not proven to be just twin-like intergrowths of two crystals. Professor A. L. Parsons, in "Contributions to Canadian Mineralogy in 1932," as published in the "Geology Series" No. 32, page 23, of the University of Toronto Press, writes about the Canadian beryl crystal, which is in the Royal Ontario Museum in Toronto. He states that the crystal is apparently twinned on the second order pyramid and that 14 measurements were made, which should interpret, without question, that they are twinning planes. So because of the agreement in angles, it should be accepted as the first record of twinning of beryl, according to his article.

Beryl has a hardness of 7.5-8, white streak, imperfect basal cleavage, uneven fracture and an index of refraction of 1.564 to 1.598. It comes transparent to opaque and colorless, white, yellow, blue, red, pink and green, with all the shades of these colors. It has a specific gravity of 2.63-2.91 and vitreous and resinous luster. The green color of the emerald type of beryl is due to chromium impurities and the color of the heliodor type of gem yellow, from S. W. Africa, is due to ferric oxide. It has been suggested that the dark yellow varieties from New England are so colored by their close contact to uranium minerals and the effect of their radium rays. Heat will turn yellow beryl to blue and also make light blue beryl darker.

The color of most minerals is a subject recently being studied in more detail, as to what impurity makes the color, by changing the lattice of a mineral's atomic

structure. Beryl is basicly white and the blue color has been reported as due to impurities of titanium and, or vanadium.

Some Well-Known U. S. Localities for Beryl

In the U. S. A., well-known quarries which have produced beryl are at North Groton, N. H.; Royalston, Mass.; Bedford, N. Y.; Oxford County, Me.; Portland and Haddam Neck, Conn.; Lieperville and Chester, Pa.; Stony Point, N. C.; Amelia, Va.; Coosa County, Ala.; Black Hills of South Dakota and Chaffee and Jefferson Counties, in Colorado, as well as Beryl Mt. at So. Acworth, N. H., which is now producing large quantities. At this quarry rare forms of beryl crystals have been found in 1949. Some crystals have been completely replaced by quartz and others by bertrandite. Many crystals there show partial changes in the same crystal from beryl to quartz and bertrandite and some crystals are golden at one end, changing to a blue-green at the other. A great deal of golden beryl is produced at Beryl Mt., but practically no clear gem material.

In June, 1949, Howard Irish, who owns Mt. Mica, near Buckfield, in Oxford County, Maine, blasted open a new pocket; the first since 1913. He was looking for more of those famous tourmalines, which first came from there in 1820. Instead he opened one of the largest pockets found at Mt. Mica, which contained a rare, white columnar beryl, containing 1.0% lithium, 1.5% caesium, and 0.1% rubidium, of unusual habit, completely terminated and displaying rare forms. These were described in detail by Prof. Cornelius S. Hurlbut, Jr., in his paper "Beryl at Mt. Mica, Maine," read at the 30 Annual meeting of the Mineralogical Society of America on November 12, 1949, at El Paso, Texas. The Harvard University Museum at Cambridge, Mass., has the largest and finest of these beryl crystals produced out of this newly opened pocket. It measures about 8" x 4" x 2".

Mr. H. S. Bryson, state geologist of North Carolina, states in "Mining Industry of North Carolina from 1929-1936" that at a Mica mine, near Spruce Pine, the clear white crystalline quartz showed a beryllium content up to 2%—a very rare occurrence.

Two Unique Woman Miners of Beryl

There are two unique women miners of beryl. One is the very active Miss Virginia Harriman,* who worked for the Ashley Mining Company at the Palermo and Beryl Mt. quarries. The other is Dr. Deborah B. Murphy—the only woman in Australia, who has successfully managed mining properties and who supplied the allies, during the war, with beryl from the Pilbara field, near Port Hedland in Western Australia, through the newly formed "New Metals, Australia Ltd.," as reported from Perth, by the N. Y. Sun of February 3, 1949.

Further information on beryl crystals may be obtained by reading an article on them in the "American Journal of Science" of 1906 by W. E. Ford. An article in the same magazine, in 1917 by A. P. Honess, gives technical details of etching figures on beryl.

Brazil Famous for Aquamarines

Minas Geraes, in Brazil, is famous for its fine aquamarines (blue gem beryl) and fine gem stones have also been found in the Palermo quarry in New Hampshire and in Oxford County, Maine. Brazil has produced from $125,000 to $2,500,000 worth of aquamarines, per year, in recent times. Considerable cutting of their own gem stones has been done in Brazil, during the war years. This native industry, which has now been curtailed a great deal, has been written up by Dr. F. A. Pough in the *Jeweler's Circular-Keystone* in issues of this jeweler's trade magazine, published in 1948.

A Brazilian official gave the late Franklin D. Roosevelt the largest known clear, blue, gem aquamarine a few years ago. It is on display in the Hyde Park, N. Y., exhibit of Rooseveltiana and weighs 1840 carats.

The best emeralds (green beryl) come from the Muzo and Chivor mines of

*"Jack-Hammer Virginia," Miner and Truck Driver at a Beryl Mine, by T. Orchard Lisle. *Rocks and Minerals*, Sept.-Oct., 1948, pp. 810-815.

Colombia and about the romance of these gems many fascinating books and stories have been written. The latest of these is "Green Fire" by Peter W. Rainier, published in N. Y. in 1942. Takowaja and Mursinka in the Ural mountains, in Russia; and Habachthal in the Tyrol, Austria, and Norway and Africa produce nice emeralds too (in mica schist). Some good gems have also been found in Australia, Brazil, North Carolina and recently a new location has been reported in India for emeralds.

Varieties of Beryl have been known under the following names:—

Aquamarine: (Means sea water) sky blue, green dark blue, greenish blue.

Bixbite: Minute raspberry red crystals from Utah. Harvard has one specimen from Mexico.

Caesium-beryl: Variety, colorless, pink, green, where CeO replaces some BeO.

Davidsonite: Greenish yellow — from Aberdeen, Scotland, named by T. Thomson in 1836 after Prof. Davidson of Aberdeen, who discovered it.

Emerald: Grass green color due to chromium. From the Greek meaning a light green precious stone.

Golden: Yellow, greenish yellow.

Goshenite: Colorless — from Goshen, Mass.—named by C. U. Shepard in 1844 after Goshen.

Heliodor: Trade name for golden yellow from S. W. Africa.

Morganite: or vorobyevite—pink, peach b'ossom—from Madagascar. Named after Mr. J. P. Morgan.

Rosterite: White—named by G. Grattarola in 1880 in honor of Dr. G. Roster.

Some Beryllium Minerals

Beryllium comes in the formulas of the following 27 minerals and further details of their individual characteristics follows.

Aminoffite, Barylite, Bavenite, Bertrandite, Beryl, Beryllonite, Bowleyite, Bromellite, Chrysoberyl, Danalite, Duplexite, Epididymite, Euclase, Eudidymite, Gadolinite, Hambergite, Helvite, Herderite, Kolbeckite, Leucophanite, Meliphanite, Milarite, Phenakite, Rhodizite, Swedenborgite, Tengerite, Trimerite.

There are also now two newly identified, yet unnamed, beryllium minerals. One is a silicate and one a phosphate.

Some Minerals "Carrying" Beryllium

The following minerals are listed by some authorities, as "carrying" beryllium, at certain times and from certain localities. Due to close contact, or environment, many minerals frequently show other elements present, than those supposed to be in their formula, which are identified by careful chemical, or X-ray analysis. In nature BeO often replaces small amounts of Li_2O, Na_2O_3, K_2O and C_2O_3. These are not true beryllium minerals, even though their analysis sometimes does show this element present.

Allanite, Aluminous Schists, Alvite—Yttrium silicate group from Norway, Aragonite—(Franklin, N. J.) Arrhenite, Bityite, Bixbyite, Brazilianite, Cyprine—(Franklin, N. J.) form of Vesuvianite, Cyrtolite, Erdmannite, Foresite, Goyazite, Millerite, Monazite Sand, Muromontite, Natural Waters (Alairs, So. France—Antiveille, Pyranees—Nerac, Pollucite—(Elba, also Oxford County, Maine), Siphlite, Sipylite—.62% Be in Virginia, Vesuvianite — complex silicate (New Mexico and Franklin, N. J.) (Strock 1% Be).

Conclusion

To complete a list of minerals, such as the above, is always an ardent collector's ambition. It is not easy to satisfy such a desire, as most of these beryllium minerals are excessively scarce and very hard to obtain. I have made a good start and have been able to find, or get most of them, in the last ten years, and from many different quarries too.

Cut and polished cabochons, or faceted gem specimens of several of these beryllium minerals, also make a desirable, though expensive, adjunct, to this specialized collection.

So as a reward for specialization in mineralogy as in any other subject, or hobby, amateur students and collectors, can become recognized by professionals as experts in their own sphere.

I would be pleased to hear from any readers, with criticisms, or further information of interest, to add to this amateur's article and of any omissions.

or errors, so that a more complete and detailed report on beryllium and its minerals can be written, in the future.

Acknowledgments

My thanks for assistance and information go to Dr. F. H. Pough, of the American Museum of Natural History, in New York City, and to Dr. O. Ivan Lee. I am also indebted to the Beryllium Corporation of Reading, Pa., and the Brush Beryllium Company of Cleveland, Ohio, for their aid in submitting some of their valuable publications.

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"Marvelous" Marin, A County in California!

Editor R & M:

I have the following unsigned letter from Petaluma, California, dated August 13, which reads:

"On page 354 ROCKS AND MINERALS, August, you tell about Vonsen and his nephrite in (Napa) County. He may prefer to have it it in Marin. "Marvelous" Marin, you know."

The letter was in a pretty envelope with flowers printed on it so I know it was written by a lady. Sorry, lady, my error and I apologize publicly to you and Mr. Vonsen. Being a member of R & M he will read this. But as for apologizing to "Marvelous" Marin, with its clean ocean beaches, swimmin' holes, wooded glens with little villages tucked away here and there, and its famous Muir Woods with its thousand year old redwood trees, it could part with Mr. Vonsen's jade as well as a handful of its other "Marvels" and have plenty left.

Of course Sonoma County in which Mr. Vonsen resides has a lot of marvels too, but Marin being just across the Golden Gate from San Francisco is the Mecca for many of the week-end hikers and I know of no lovlier glen than Muir Woods.

R. F. Henley
San Francisco, Calif.

August 21, 1950

Good Reading for the Amateur Geologist and Mineral Collector

An unusual amount of good reading for the interested layman, the amateur geologist and the mineral hobbiest is contained in "The Earth for the Layman" just issued by the American Geological Institute. Sub-captioned as "Selected books and pamphlets, mostly nontechnical, on geology, mining, rocks, minerals and gems, fossils, evolution and related subjects," the list of 625 titles covers the gamut of non-technical reading from novels with a geological background or the identification of common fossils, to instructions on how to identify minerals and grind the facets on a gemstone. Occasional annotations are of material assistance to the reader.

Compiled by Mark W. Pangborn of the U. S. Geological Survey Library, this preliminary list will also be invaluable to librarians called upon to advise hobbiests in the earth sciences, high school teachers and students of earth science, or the layman interested in nature study or conservation. It will also serve as an excellent guide to librarians in setting up exhibits for those interested in various phases of conservation.

"The Earth for the Layman," price $1.00 prepaid, American Geological Institute, 2101 Constitution Ave., N. W., Washington 25, D. C.

THE RUBIES OF COWEE VALLEY, NORTH CAROLINA

By MELBOURNE SMITH
Cashiers, North Carolina

The Ruby Valley of Western North Carolina, along Cowee Creek and its tributaries, enjoyed a brief hope during the summer of 1949 that mining operations in its ruby-bearing gravels might soon be revived after a lapse of 35 years.

The older men in the valley cannot forget the enthusiasm for the future of Cowee Valley rubies shown by men like George Frederick Kunz of Tiffany's and William E. Hidden, the naturalist and practical mining authority of Newark, N. J., when they were frequently in Cowee Valley during the late '90's and the first decade of 1900.

Fine rubies of as true color as any ever mined, though none larger than four carats in size, were recovered in those early operations, together with large quantities of perfectly shaped corundum crystals ranging from translucent ruby, pink and mauve crystals, through all shades of brown, to those that when polished were a brilliant black opaque.

Some of these translucent to opaque crystals show asterism, others a schiller that is sometimes called chatoyant.

Although the mining of the '90's and early 1900's was on a fairly large scale, it was largely a hand operation, and the percentage of marketable stones, while very consistent, was a shade too low to meet the costs.

Because the field could not be made to pay, though there were rubies still to be had. the undertaking was finally abandoned in 1914 by the Consolidated Ruby Mining Co., of New York.

A New York Collector and Dealer Does Some Placer Mining

Hope of a mining revival in the valley has developed from the operations of Sherman McMillan, a New York book and mineral retailer, who carried on placer mining on Caler Fork during July, August and part of September, 1949.

Mr. McMillen had done some placer mining in the valley during the summer of 1948 and was sufficiently encouraged by his findings to return for a longer period last summer.

His 1949 operations were near the junction of Dalton Branch with Caler Fork on the land of Weaver Gibson, and the site is within a stone's throw of the location of he old ruby company's headquarters, now the site of the home of Will Holbrook, who was an employe of the ruby company and caretaker of its properties after suspension of work in 1914.

The McMillen operation was carried on by Mr. McMillen and Mr. Gibson and they accumulated quite a pile of tailings beside the stream, which is easily to be seen from the valley road.

There are always some rubies and a good percentage of corundum crystals of small size to be found in Caler Fork gravels, but the McMillen results were not announced. Mr. Gibson, however, is quoted as expressing satisfaction with his end of the transaction.

This field is pretty well open to any collector who would relish a few days digging. He can usually arrange a lease on a percentage basis and can engage help. A good place to start would be with Mr. Holbrook, who has lived all his life in the valley, enjoys a splendid reputation and is about the most ruby-conscious individual one can imagine. He knows everybody in the valley, is akin to most of them, and is always most obliging, particularly if you are interested in rubies.

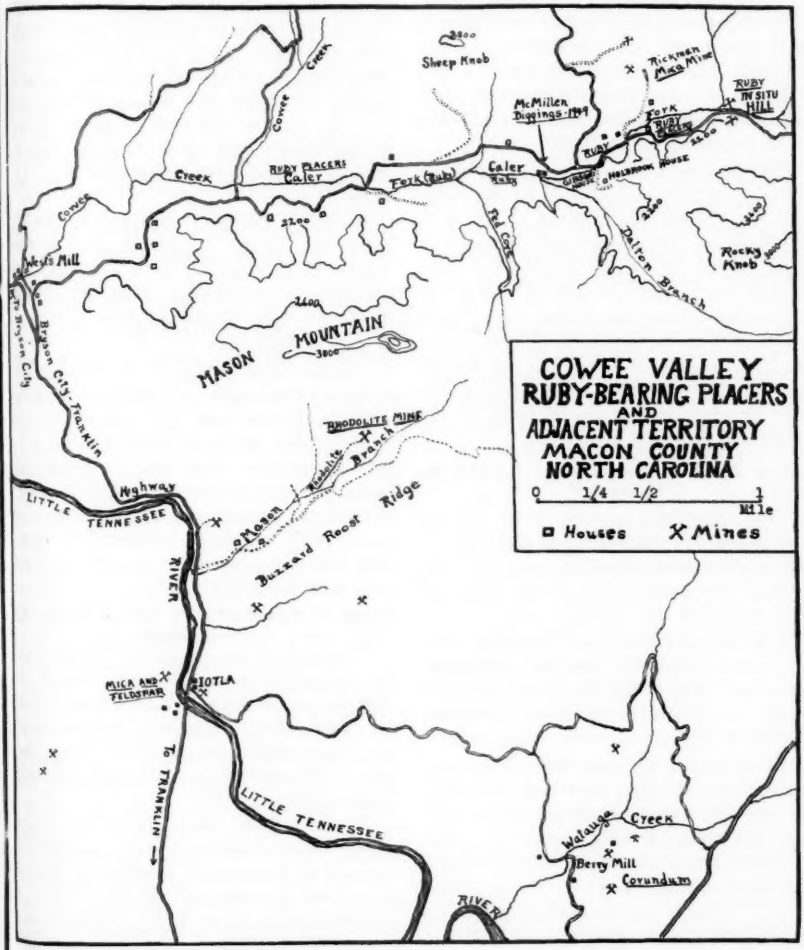
Location of Ruby-bearing Area Easily Accessible from Main Highway

Cowee Valley is roughly 6 miles north of Franklin, county seat of Macon County, N. C., on the highway to Bryson City and Smoky Mountain Park. The valley is 28 miles south of Bryson City if one is coming in from the north or from the Park. By the shortest route the valley is about 80 miles southwest of Asheville.

Cowee Valley runs almost due east and west. Coming up from Franklin the highway crosses the west end of the valley at West's Mill, a little settlement that one cannot miss, comprising the old watermill, a couple of stores and a large school building.

From West's Mill two gravel roads run up the valley to the east and the preferable road is on the south side of the creek. This road is fairly good and passable at all times.

By this road it is roughly 2 and ¾ miles to the Weaver Gibson house and to Will Holbrook's house. The road runs



The above map is based on the revisions of the old U. S. Geological Survey quadrangles by the Tennessee Valley Authority in 1946 and 1947. The scale was raised from the old half-inch to the mile to a new scale of about 2⅝ inches to the mile. The number of quadrangles was greatly increased and much detail both of topography and culture added. The area mapped above falls in four of the new quadrangles: Greens Creek, Alarka, Corbin Knob and Franklin.

The road to Cowee Valley begins at West's Mill, which will be found on any good map, on the Bryson City-Franklin highway, a first class road noted for its scenery. The road to the south of Cowee Creek leads to the ruby placers. The rhodolite garnet area will be seen on the map at the south of Mason Mountain.

along the south side of the valley for about 1 and 6/10 miles, then crosses to the left over Caler Fork and continues along the north side of the valley for the balance of the distance.

In traversing this route from West's Mill, avoid the first turn to the left at mileage 1 and 1/10. This crosses over Cowee Creek and proceeds north to some villages. Keep straight ahead east to the second crossing to the left.

The Holbrook house sits up on a sharp little knoll to the right side of the road, and the Gibson house right under it to the west on the valley level. There is a small bridge over Caler Fork to the right at this point, with a drive of about 100 feet to the Gibson place, and a sharp road up the hill to the left to Holbrook's. The road looks steep, but it is easy in second gear and is quite short, and there is ample turning space at the top in front of the Holbrook garage.

Rubies Occur in Gravel Beds Overlaid By Valley Soil

The corundum crystals occur in the soil and in the exposed creek gravels, but this is slow and disappointing work because these sources have been long and well picked over.

The sure place to find corundum crystals, with occasional ones of color and sometimes of gem quality, is in the gravel beds, which vary in thickness from two to 10 feet.

These gravel beds are overlaid by soil, usually two or three feet deep near the streams and somewhat thicker in the valley floor generally. Digging is most practicable at the stream since water is available for washing.

The natives use a crude rocker for washing and the corundum crystals are picked out by hand. The ruby color permeates the gravel beds, all the gravel having a sort of old rose tinge.

Along with the corundum crystals is a considerable percentage of rhodolite garnet fragments, usually clear and of good color, but small, and some have little black inclusions that impair their appearance.

Close Similarity of Cowee Gravels to Burmah Field Cited by Authorities

The occurrence of the Cowee ruby-bearing gravels is said to be very similar to that in the Mogok Valley of Burmah, known as the world's premier ruby field. Experts on Burmah mining visited Cowee Valley when operations by American Prospecting and Mining Co. were at their height in 1896 and reported officially that the quality and percentage of Cowee rubies were equal to the Burmah yield, American labor costs, however, were too high.

Probably the best authority, and certainly one of the most conservative, Dr. Joseph Hyde Pratt, in his "Corundum and Peridotites of Western North Carolina," Page 183, referring specifically to Cowee Valley rubies, says:

"Some large gems—3 or 4 carats in weight—have been cut which were free from inclusions and of fine color and transparency. A great many smaller perfect gems have been cut. In color and brilliancy these are equal to the Burmah, and if the percentage of the unflawed transparent material increases but little, this new field would be a well-matched rival to the Burmah fields."

Origin of Cowee Rubies Still a Puzzle To Mineralogists

The original source of the Cowee Valley rubies has never been determined, although mineralogists have spent much time and effort to that end, and two mining companies have tried to locate the source by expensive shafts, tunnels and core drilling.

Placer rubies were traced up Caler Fork to a small hill where the matrix lead seemed to be so well established that it was given the name of "In Situ Hill."

The United States Ruby Mining Company sank a shaft on this hill in 1907, diverted the water of Caler Fork to give a good head for hydraulic purposes, and produced a large quantity of corundum crystals from the hornblende gneiss which was believed to be the matrix rock.

It was found, however, that these corundum crystals were almost uniformly translucent pink and lilac, with no stones of the true ruby color such as occur in

the valley placers.

Work was suspended in 1907, but in 1913 was resumed by the Consolidated Ruby Co., of New York, at In Situ Hill, where extensive drifts and core drilling, continued through 1914, resulted only in more corundum crystals of small size and poor color, and it was obvious that the matrix of the true rubies of Cowee Valley had not been found.

All ruby mining was suspended in 1914 and there has been no revival with the exception of the McMillen operations. The official report of the State Geologist, dated 1919, leaves the issue of profitable ruby mining in Cowee Valley in doubt. There has been "no definite determination," he says, "as to whether or not the property can be profitably worked."

The Periods of Active Ruby Mining Briefly Sketched

The first official report of rubies in Cowee Valley was made by Dr. Kunz in "Mineral Resources of the U. S. 1893." Occasional good stones began to turn up in New York, usually at Tiffany's where the local people sent them to be cut.

Mr. Hidden, who missed nothing in a mineral way from the great thorium belt of the Carolina South Mountains to the rare lithia emerald of Stony Point, N.C., that bears his name in hiddenite, was early on the Cowee scene and wrote the first scientific treatise on the ruby crystals. Mrs. Holbrook, who was reared in the house now occupied by the Gibsons, remembers Mr. Hidden as a visitor to the valley in 1895, and frequently thereafter.

Commercial production from Caler Fork placer gravels was begun in 1895 by the American Prospecting & Mining Co., and continued through 1899. Hydraulic lines to wash down the gravels after the banks had been exposed by hand labor was used, but there was never an adequate supply of water.

The areas worked out in all the placer operations were never very large and there is said to be plenty of virgin ground. The best gravels cover an area figured at two miles long by an average of an eighth of a mile wide. These gravels are pretty well confined to Caler Fork from In Situ Hill to the junction of the Fork with Cowee Creek, though corundum is found all the way down the valley to West's Mill.

From 1899 to 1906 there were no commercial operations. The revivals of mining in 1906-07, and again in 1913-14, are referred to above.

Culls from Ruby Mining Put to Practical Use In Concrete Foundation

When mining was finally suspended in 1914, large quantities of corundum crystals of every kind except strictly gem quality, were stored in the warehouse in steel buckets that held black powder. The capacity of these buckets was around ten gallons.

Sometime later the warehouse burned and the only thing that survived the fire was the corundum in the buckets. Not long afterwards, Will Holbrook, who was caretaker for the company, acquired title to the warehouse property and began to build a home on the site.

The corundum crystals, quite intact except for some smudge from the fire, looked like a good mix with cement for the concrete foundation, and they were all used for that purpose except about a half bucket that the workmen probably overlooked. These were kept in the barn and were gradually given away to visitors by Mr. Holbrook. The writer acquired about 10 pounds of what was left and the balance went to a collector in Atlanta.

About 40 pounds of culls from the In Situ Hill shaft were acquired by the writer from the estate of John Rickman, who mined mica in Macon County for years and had a small mineral collection. These culls are of a much lighter shade than the placer culls, and there is very little ruby color in them at all—mostly light brown, pink and lilac, and most of them translucent.

Most of the Natives Have Small and Indifferent Collections

Collecting is a side-line with many of the native farmers and the children, and every household has a small box of crystals, rarely anything of gem quality, which will be produced when a sale is in sight. Until recent years these crystals could

be bought at reasonable prices, but lately local ideas of crystal values have undergone considerable inflation.

To the collector with a good knowledge of crystallography, the corundum crystals of Cowee Valley offer a field day. Twenty-nine distinct forms of the corundum crystal have been observed from Cowee Valley.

Twinning is frequent, usually the common twinning plane parallel to the rhombohedron. Penetration twins are less frequent and there is a rare form noted in Cowee Valley by Mr. Hidden, in which the twinning plane is parallel to the base.

Frequent Inclusions Rendered Many Rubies Worthless

The best developed of Cowee crystals are usually small, with diameters of 3 to 4 mm., and lengths up to 6 or 8 mm. The tabular form ranging up to a half-inch in diameter is also common and it is in this form that asterism is most frequently observed.

Some of these tabular crystals, usually those of a bronze color, show highly polished faces and an underlying luster that is sometimes referred to as "chatoyant." Probably "schiller" would be a more accurately descriptive word.

These polished surfaces are due to the habit of parting so common in Cowee Valley crystals. Parting also accounts for the striations seen on many crystals, and may have had something to do with the asterism.

One of the headaches of the mining companies was the large percentage of Cowee rubies containing inclusions, from bits of rhodolite and rutile of considerable size to very minute particles that cause what jewellers refer to as "silk."

Rubies Suffer by Intimate Association With Rhodolite

Many crystals, some of them of fine transparent ruby color, are rendered valueless by small cavities created by the rotting out of rhodolite garnet inclusions. These tiny cavities have been definitely identified by wax casts which showed clearly the typical garnet inclusions, and they correspond identically with rhodolite garnet inclusions that are still intact.

In fact the only true crystals of rhodolite garnet that have ever been found are these tiny crystal inclusions within the corundum crystals. All other rhodolite has been in irregular fragments, some of them quite large. Frequently a corundum crystal is found to be literally honeycombed by these decomposed rhodolite inclusions.

Another worry for the mining companies is the considerable proportion of transparent gem material that is badly flawed by cracks due to parting. This further reduced the percentage of perfect stones from Cowee Valley. However, mineralogists who knew the Burmah fields said this was also true of Burmah crystals, and it was also emphasized that a large percentage of the rubies that are on the market are more or less flawed, usually with parting cracks.

Pleochroism is also very marked in Cowee rubies and this has often made very difficult the cutting of a stone to show good color from all angles.

Associated Minerals Provide a Wide Variety

Practically anything in the mineral line is likely to turn up in the Cowee Valley placers, including now and then a particle of gold or a platinum mineral. The minerals that have been found, in addition to the ever-present corundum and rhodolite garnet, have been noted by competent authorities as follows:

Gold, pyrite, chalcopyrite, nickeliferous pyrrhotite, sphalerite (blende), sperrylite (the rare platinum arsenide), ilmenite or menaccanite, rutile, bronzite (in clear transparent masses or fragments), hornblende (a rich soda variety), zircon (in very brilliant colorless and reddish crystals, 0.5 to 2mm. in length and perfect in their development), sillimanite, cyanite, staurolite (in clear transparent fragments), iolite (colorless), and monazite.

Area Is Highly Mineralized

The entire area from Franklin on the south to Cowee Valley is obviously highly mineralized. Mica and feldspar mining is on a substantial and permanent basis, and some of the mining operations of considerable extent can be seen from the highway along the Little Tennessee River.

On the north edge of Cowee Valley about opposite the Holbrook place is the site of the mica mine known in the Valley as Shepherd Knob, but shown on the U. S. Geological-TVA map as Sheep Knob. This mine was worked by tunnel during the last war and produced good sheet mica, as well as ground mica.

During the last year a large part of the Knob has been scooped out by bulldozers, loaded into trucks and taken to Franklin for cleaning and conversion into scrap and ground mica. This was found to be more remunerative than tunnel mining for sheet mica.

Rhodolite Mine is Just Across the Mountain From Cowee Valley

The south wall of Cowee Valley is Mason Mountain, a huge bulk that runs eastward from the highway for more than three miles. This mountain is the home of the rhodolite garnet, the very valuable gem stone that was mined extensively around the beginning of the century. The bulk of this production was said to have gone to Tiffany.

The largest brilliant-cut stones from Mason Mountain rhodolite are officially reported to have weighed up to 13⅜ carats.

Fine Gem Qualities of Rhodolite Described By Dr. Kunz

Dr. Kunz of Tiffany's was most enthusiastic about the gem qualities of Mason Mountain rhodolite, which he described as follows:

"This name (Rhodolite) is from the Greek word 'rhodon', a rose, from the resemblance of its color to some kinds of roses and rhododendrons. The mineral shows a light shade of fine red, without the dark aspect that belongs to most garnets, and it possesses a remarkable degree of brilliancy, especially in artificial light.

"These qualities give it great value for gem purposes and it has become very popular. The pieces found are not generally large, but stones have been cut of as much as 14 carats."

No Longer Exclusive to North Carolina: Found Lately in Greenland

Rhodolite was a brand new garnet, an intermixture of pyrope and almandine garnet, in the proportions of 2/3 pyrope and 1/3 almandine. It was believed to exist nowhere else in the world than in Macon County, but a report in *Rocks and Minerals,* Nov., 1945, p. 526, and Sept., 1947, p. 813, cites a well-authenticated source of this identical gem stone on the west coast of Greenland, near an army camp located about 50 miles north of Ivigut, the cryolite locality.

This Greenland discovery was made by Commander John Sinkankas, U.S.N., an aviator who helped to get stranded American plane crews off the Greenland ice cap during the war. Commander Sinkankas stated that boulders of mica schist, in which the rhodolite is disseminated as in North Carolina, are a part of the glacial drift that covers the locality, so that the ultimate source of the rhodolite is not known. These Greenland garnets have been definitely identified as true rhodolite.

The North Carolina rhodolite area is directly across Mason Mountain from Cowee Valley and is readily accessible from the Franklin-Bryson City highway at a point less than two miles south of West's Mill. There is nothing to mark the road that leads a hundred yards to a house and it would be well to have a local man along who can act as guide. The caretaker lives in the second house in from the road and it would be well to go through the formality of seeing him. If a collector has been in Cowee Valley and has contacts there he will find that most anyone knows where the rhodolite mine is and will guide him there. The walk to the mine is an easy one, less than a mile.

Placer Mining Profitable, But Matrix Mine Was a Dud

The mining that really produced rhodolite in quantity was placer mining along Mason Branch. Here the pieces, or fragments, (no crystals) occurred up to fairly large pieces, mostly flawless and of good color, quite different from the small and generally pale fragments found in Cowee Valley.

By 1910 the Mason Branch placer workings had been pretty well gone over by the two gem companies that had operated there and the companies began

a search for the matrix source of the rhodolite. They found on the side of the mountain just up from the branch an outcropping of mica schist that was speckled with rhodolite blobs like raisins in a plum pudding.

This was it, they thought, but as with the corundum at In Situ Hill, the rhodolite in the matrix was not gem quality, all of it being shattered and most of it not of the rich color of the stones found in the placers.

A large drift was run into the outcropping and the stone crushed to recover the garnets, but the net result was a series of dumps of crushed material that really is about half rhodolite fragments. A quart of clean frgments can be picked up in an afternoon, and to the collector they are truly good rhodolite fragments, but of no value to the lapidary. Very rarely a fragment large enough to be cut may be found, but the color is usually pale.

Rhodolite Disseminated Through Boulders Of Schist

Just below the dumps are a quantity of large boulders that were taken out of the mine cut. Most of these contain rhodolite disseminated through the schist, sometimes an almost solid concretion of rhodolite fragments. Some of this stone yields a very pretty variegated cabochon, but it is said to be very tricky to cut, due to the differences in the degrees of hardness of the schist and the garnet.

Many of the boulders have been broken up by mineral hunters and this is the source of the "rhodolite in mica schist," and the dumps described above are the source of "rhodolite concentrates in vial," that are occasionally offered by mineral dealers.

There is still some sporadic wildcat digging for rhodolite in Mason Branch, and usually there is some rhodolite of gem quality to be obtained from dealers in Franklin. There are responsible citizens, like the late John Dalton, surveyor, of Cowee Valley, who insist that there is still plenty of rhodolite in Mason Branch, but finding it is like taking a chance in a raffle.

Cyanite and Other Minerals from Gopher Hole Mines on Mason Mt.

Higher on Mason Mountain are various gopher holes where prospectors have taken out mica and some fairly good cyanite, though the blue color is rather light. The best crystals are a white cyanite. There is also a pure white milky quartz, decorated all over with small mica books, that makes showy specimens.

One might be able to stumble on some of these diggings, but the climbing is not easy and a guide would save a lot of time and unnecessary walking.

Bibliography

There is a large literature on corundum and corundum gems of North Carolina, but no attempt is made to cover all those references here. The following abridged list covers the works of importance on Cowee Valley and the rhodolite garnet occurrence on Mason Mountain, Macon County, North Carolina:

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NEW JERSEY BROOK A CARNELIAN LOCALITY

By PETER ZODAC
Peekskill, N. Y.

On Sunday, July 23, 1950, the Newark Mineralogical Society, of Newark, N. J., held a field trip to a carnelian locality in the northern part of the state. The locality is a small stream, Branch of Stony Brook, in South Stirling, Somerset County, N. J. Leonard A. Morgan, Chairman Outing Committee of the Society, was leader of the field trip. The members had met at the intersection of Route 29 and Somerset Street, North Plainfield, N. J., at 9:30 a.m. sharp on the 23rd from which point they headed for the locality.

Some very nice dark red gem quality carnelian had been found at the locality and I was anxious to visit the spot and collect a few specimens, myself. On mentioning the locality to Mr. Mark Robinson, of New York City, he became interested and wanted to visit the locality also. We therefore arranged for him to pick me up in Peekskill, N. Y., about 8:30 a.m. Sunday.

Graphite Mine Near Peekskill

It was 8:45 a.m. when we left Peekskill heading north for the Bear Mountain Bridge, 4 miles away, where we would cross the beautiful Hudson River and then head southwestwardly for the locality. Once out of Peekskill, Mr. Robinson expressed a desire to visit an old graphite mine located a little north of the city, which we did and where we secured a few specimens of graphite in schist. We then headed for the Bear Mountain Bridge where we took route U. S. 202 (which goes over the bridge) and headed for New Jersey.

Journey To So. Stirling, N. J.

U. S. 202 goes southwestwardly to and beyond Bernardsville, N. J., and we passed through such places as the famous Bear Mountain Park, and the following towns and cities as Suffern, N. Y., Pompton Lakes, Boonton and Morristown—all in New Jersey. At Bernardsville we got off 202 and turned left on a black top road for Stirling. About a mile before we reached Stirling we stopped for lunch at the Country Tea Room where we obtained some very good hamburgers, coffee, etc. and at the same time asked for directions on reaching Stirling as the little town was not indicated on any signs seen. We were on the right road, however, and were told to continue on about ¼ mile, turn left at the Baptist Church, and when we reached the first blinker light in a small community we would be in Stirling and there we were to ask for directions on reaching South Stirling.

The following is the mileage clocked from the Bear Mountain Bridge:

64.0 Bear Mountain Bridge.

87.0 Suffern, N. Y. on New Jersey border.

99.9 Pompton Lakes, N. J.

113.2 Boonton, N. J.

114.1 Large reservoir; we go over a long bridge on U. S. 202.

122.9 Morristown, N. J.

130.7 Bernardsville, N. J. Here we turn left on unmarked black top road.

137.3 Country Tea Room at junction of 2 roads.

137.5 Turn left at Baptist Church.

140.0 Stirling, N. J.

140.5 Turn right at Esso gas station.

140.8 Cross Passaic River (a small stream); in center of the wooden bridge (left side) is a county sign (Morris-Somerset County Line). Stirling is in Morris County; South Stirling in Somerset County.

141.5 Cross roads—go straight ahead.

142.4 Touchon's Cocktail Bar (right side of road). Here turn in and park as a large picnic area is in back of it.

We reached Touchon's at 1:30 p.m. and just as we turned in to park, Mr. Morgan spotted us and came forward to meet us, followed by Mr. Albert S. White, President of the Society. They had been on the lookout for us because I had contacted Mr. White by phone, earlier in the day (about 8:00 a.m.) asking for directions on reaching the locality. After the greetings were over, Mr. White then delighted us both by presenting each of us

with a fine specimen of autunite. The specimens were collected by Mr. White at the Wardwell quarry in Albany, Maine, when the Society held a field trip to the area earlier in the month (see "A field trip at night," by Mr. White, printed elsewhere in this issue).

Digging At The Diggings

Getting our paraphernalia out of the car (a small sieve, trench shovel, some cans, etc.—we were to work in a brook, you remember) we followed the two collectors to the diggings, about 700 feet away and in back of Touchon's Bar. The diggings were in the woods, about 400 feet beyond the outside limit of the picnic area. We followed a path, and crossing the brook here and there, we noticed that the water was a dirty yellow—due to the diggings beyond. The brook averaged about 10 feet in width but at the diggings it was only 6 feet wide. When we reached the diggings, we saw a number of men and women, also some children, digging and shifting the sand and gravel from the brook bed. I took off my shoes and socks, rolled up the pant legs, and waded into the water. The water was only about a foot or so deep, and as it flowed quietly, the digging operations were not too strenuous. The brook bed, at least where I was digging, was practically all sand and a few inches below the sand it was bluish clay. Along the left edge of the brook, the blue clay extended a few inches above the top of the water and could be seen in the bank. No pebbles could I find in the clay; it was the sand and gravel area bordering the right edge of the brook (facing Touchon's) that was carnelian-bearing. I would dig into this area (it was very soft), shovel it into the sieve (an old kitchen utensil whose holes were too small to be very satisfactory) then I would wash away the sand (panning process as in gold panning), pick out the large worthless material to be thrown away and then examine carefully what was left. There was a lot of basalt pebbles (worthless rock) which varied from ½ up to 3 inches in diameter and this was easily spotted and thrown away. But among the pebbles panned, I found carnelian, jasper, rock crystal. amethyst, etc. Mr. Morgan was near me for many minutes, digging away, and he was kind enough to give me some of his good finds. There were about 12 men and women working in our vicinity and one of them found a beautiful gem carnelian that must have been at least 2 x 2 inches in size.

The day was very nice, the digging not too strenuous, the water was warm, and as we were not molested by mosquitoes or other insects, the collecting was most enjoyable; those collectors who wore bathing suits must have been extremely comfortable as they could get a dip in the deeper parts and especially above the diggings where the water was clean.

Minerals Found In The Diggings

Among the minerals found in the brook by me at least as I did not have a chance to check with others, are: (all are varieties of quartz).

Agate: Thin, ½ inch fragments, whitish and finely banded.

Amethyst: A ¾ inch loose crystal showing a faint purplish cast in its transparent crystal face.

Carnelian: This is the most interesting mineral found at the locality and it occurs in masses varying from tiny up to 2 x 2 inches or more in size. It is found chiefly in flat very slightly, waterworn pieces (most of it shows quite sharp edges), sometimes having a botryoidal surface. Its color is dark red and when found in translucent pieces it should cut into lovely gems.

Chalcedony: Nice brownish to reddish masses having a botryoidal surface. Two specimens, one of each color and both about ½ inch in diameter and opaque, were found. Some of the carnelian and chalcedony show the imprint of calcite crystals that lined the cavities in which the chalcedony was deposited.

Drusy: Found chiefly incrusting cavities in carnelian. It is generally rock crystal.

Ferruginous: This is the most common mineral at the locality. It is almost always in pale shades of brown (a few tiny pebbles were reddish) and it varies in size from tiny up to 2 x 2 inches or more and generally it shows crystal faces.

Some of this ferruginous quartz approaches citrine in color.

Jasper: A number of specimens were collected, all brownish in color. The largest was 1 x 1½ inches in size, deeply pitted, and consisted of thin brownish jasper bands and threads in a dark quartz matrix.

Milky: Tiny pebbles of milk-white color.

Rock Crystal: Is the chief drusy mineral noted; also occurs as tiny loose pebbles, sometimes showing crystal faces.

Smoky: A ½ inch pebble found which showed crystal faces of a dark smoky color.

Tiger Eye: Mr. Morgan found a specimen which had the chatoyancy of tiger eye. It was very nice but I could not determine its true identity on a casual examination. Tiger eye is petrified asbestus and I never heard of such a mineral being found in New Jersey nor anywhere else in the United States. A letter from him, dated Aug. 13, 1950, gave the following interesting information:

"The tiger eye occurs at all the carnelian localities. It is a lot scarcer than the carnelian but I have collected a few dozen pieces of it. It is definitely a quartz pseudomorph after an asbestiform mineral, if not after crocidolite as the African tiger eye, then probably after byssolite or mountain leather, both of which occur in basalt. I am sending you a slice of the tiger eye which shows both the yellow and the blue colors in which it is found."

The small thin slice sent by Mr. Morgan shows definitely that it is a quartz pseudomorph after an asbestiform mineral. It is a nice little specimen.

Also collected from the brook bed was a jar of fine gravel (consisting chiefly of basalt with some quartz) and sand (coarse sand consisting chiefly of basalt with some quartz).

History Of The Locality

I am indebted to Mr. Leonard A. Morgan, Chairman of the Outing Committee of the Society, for the following information:

The original locality for carnelian in the vicinity was in a brook about 5 miles northeast from the above South Stirling locality. This original locality was near Berkeley Heights (near Bonnie Burn Sanatorium) and was found between 1935 and 1940 by Mr. James DuPont, of Chatham, N. J.

During the gas rationing days of the past war, Mr. Morgan explored the area on foot, hoping to find another locality for carnelian. In this way he discovered the Stony Brook locality back of Touchon's Cocktail Bar, during the summer of 1943. He has found carnelian in a couple of other brooks but the Stony Brook is the best of all.

Return Journey

We left about 4 P. M. (as Mr. Robinson was anxious to get home early), leaving most of the collectors digging away in the pleasant brook. We followed the same route back, crossed the Hudson via Bear Mountain Bridge, and reached Peekskill 7:30 p.m. Mr. Robinson must have reached his home about 9:00 p.m.

Total mileage for the day—177.

Total number of collectors at the diggings—35.

(Note: 9½ miles northeast of Suffern, on U.S. 202, and bordering the left edge of the road, is a large sand and gravel bank, belonging to Mt. Ivy Sand and Gravel Co. We stopped here for a few minutes so I could obtain a sample of the sand (mostly quartz) for my collection of sands. The locality is in Mt. Ivy, Rockland County, N. Y. It is my first and only sample of sand from the county.)

Pebble Swallowing Defeats Ruling

In Kestiras, India, a union of gem polishers protested unsuccessfully against a management decision to X-ray employees every night as they left for home. The humilating practice was completely abandoned after three weeks. The union drove the bosses almost crazy by having everyone of its members swallow two or three pebbles just before closing time.

—Utility Worker's Union of America
The Brotherhood Record, August, 1950

A FIELD TRIP AT NIGHT

By ALBERT S. WHITE
Flanders, N. J.

Having discovered the presence of autunite on a previous visit to the Wardwell Quarry in Albany, Maine, in June 1949, the writer, in the company of members of the Newark Mineralogical Society, visited this famous beryl locality the night of July 6, 1950.

It was a warm summer evening that greeted the members of the Newark Society as they emerged from supper at Green's Snow Falls Restaurant in West Paris, Maine, and started for their cabins across the road. This night was destined to produce something of extraordinary interest as the voice of Vincent Giordano was heard to say: "Let's go to Wardwell's Quarry and look for autunite with the Mineralight." It didn't take the crowd long to respond in the affirmative.

Collecting their gear, the happy rock hounds were soon on their way, arriving at Wardwell's Quarry (Albany, Maine) just as the last light of day slipped from the sky.

Parking their cars near the entrance of the quarry road the group with flashlights in hand made the short distance to the quarry on foot. Just before reaching the first large dump a number of large pieces of feldspar, containing books of mica were encountered. It was in this pile that the attention of the group was directed. Extinguishing their flashlights, Gavin Taylor snapped on his portable Mineralight. At once the ground lit up like a Xmas tree. Fluorescent yellow green autunite was everywhere and with it were beautiful fluorescent orange manganapatite crystals. As Mr. Taylor moved from spot to spot eager hands reached out for specimen pieces. Before long everyone was busy breaking up the larger rocks and testing the broken pieces under the Mineralight. Piece after piece responded and it was soon evident that the group had about all they could carry back for one night.

Later, returning to their cabins, everyone agreed it was a most profitable evening and one not soon to be forgotten.

MINERAL INDUSTRIES MAIN BUSINESS IN SPRUCE PINE DISTRICT, N. C.

Commercial mining of minerals in the Spruce Pine district began in 1867 with very limited production of sheet mica. Total output the first year was probably less than $1,000. Today the mineral industries of the district are shipping at a rate estimated to be close to $7,000,00 and employ over 2,000 people. The principal minerals produced are feldspar, mica, kaolin, and vermiculite There are some 250 known minerals and semi-precious stones to be found in the district.

The Tri-County News, Spruce Pine, N. C., in its issue of Thursday, June 29, 1950, featured a long illustrated article, "Mineral Industries are Main Business Here," by S. T. Henry, Editor of the paper.

Another interesting article in the same issue and titled, "Cuts Local Gems and Semi-precious Stones," features Roby Buchanan of Hawk, N. C., the State's most famous gem cutter. It is a long illustrated article and includes many of the gem stones found in the Spruce Pine district.

Still another interesting and illustrated article in the same issue features Linville Gorge, which is considered to be the most spectacular in the east.

Spruce Pine, in Mitchell County, is beyond doubt the most famous mineral locality in North Carolina. Every year, hundreds of collectors, from all parts of the country, visit Spruce Pine. If you plan to visit the district, or to keep in touch with developments there, we would suggest that you subscribe for *The Tri-County News,* Spruce Pine, N. C. Issued every Thursday and subscription price is $2.00 a year.

CALIFORNIA CONVENTION MEETS ON DESERT

By CLARK HARRISON
Box 392, China Lake, California

On June 17-19, 1950, a most colorful event took place in the middle of the Mojave Desert, when the California Federation of Mineralogical Societies, Inc., held their gala annual convention at Valley Wells, four miles out from Trona, Calif.

Some 2500 persons attended this conclave to view the many breath-taking creations of the lapidary art and beautiful awe-inspiring specimens; and to explore the reaches of the great Mojave Desert, made famous by Indians, miners and prospectors, the 40'ers, and other historical forces. The weather was perfect—the mornings and evenings pleasantly cool, while the mid-days reached up in the nineties.

The host societies were: Searles Lake Gem and Mineral Society of Trona; NOTS Rockhounds of the Navy Base at China Lake; and the Mojave Mineralogical Society of Boron. Scene of the convention was the beautiful desert oasis known as Valley Wells, which has the state's second largest swimming pool enclosed by "smoke trees"—tamarisk and athel varieties. Five days before the meeting visitors began pitching camp. from as far away as Oregon. By Friday night the campfires indicated hundreds of campers, eagerly awaiting for the opening of the next day.

Near the cool water of the huge outdoor swimming pool, a huge tent housed the club and individual collections; and all types of collections were represented and entered in the regular competition. Dealer's Row, a space two blocks long, and occupied by 20 dealers, presented a wide variety of material (both cutting and specimen) and interesting displays and demonstrations of lapidary and faceting equipment.

On Saturday afternoon a wonderful barbecue meal was served by John Bernhardi and John Pillot of Searles Lake Gem and Mineral Society. They also kept the convention well supplied with sandwiches, ice cream and short orders.

Saturday night a big campfire meeting was held with the first part of the program dedicated to the installation of the new Federation officers. Retiring president, Jack Streeter, thanked the former officers for their help and cooperation, and introduced the new officers: President, R. O. Deidrick, East Bay Mineral Society; Vice-president (Mineral and Geology Section), Modesto Leonardi, Searles Lake Gem and Mineral Society; Vice-president (Lapidary and Gem Section), C. A. Dietrich, San Diego Lapidary Society; Secretary, Mrs. Ilga Hinsey, Sacramento Mineral Society; Treasurer, Mrs. Dorothy Craig, Southwest Mineralogists; Editorship of official organ, Mineral Notes and News: Don Maclachlan and Ralph Dietz, NOTS Rockhounds (replacing Paul VanderEike, who is retiring). After installation of officers, the meeting was turned over to O. K. Shead of the Mojave Mineralogical Society who conducted a very successful auction.

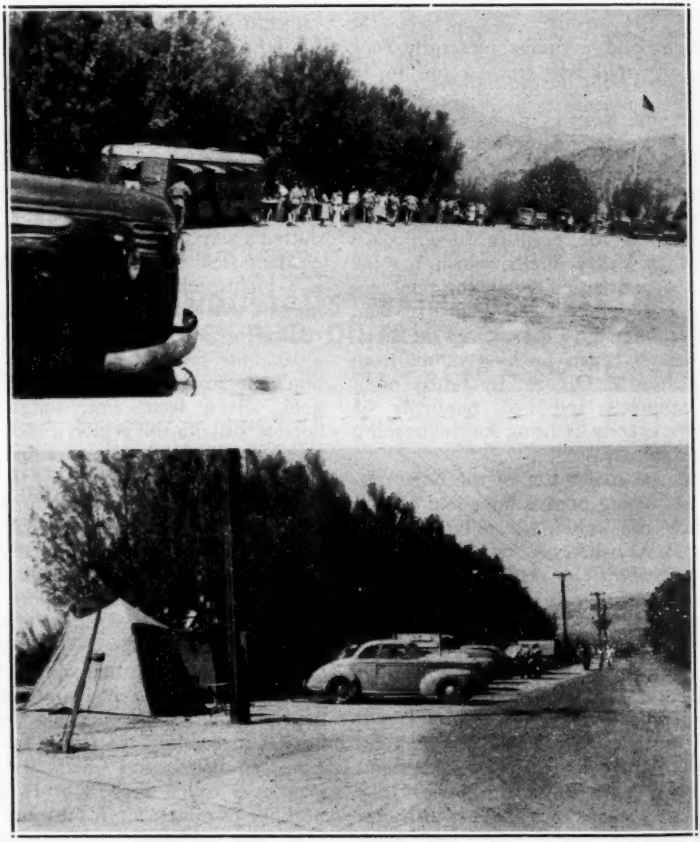
Many field trips were taken. Since this is a highly mineralized area, with many mines, the conventionites enjoyed an endless variety of specimen hunts. Within a 100-mile radius lie several of the nation's foremost producing districts of gold, silver, lead, zinc, tungsten and borates, making this region a rockhound's paradise. Within this area are many ghost towns. A short drive takes one to famous mining places like Cerro Gordo, Darwin, Keeler, Calico Mountains, Randsburg, Red Mountain, Atolia, Johannesburg, Boron, Silver Queen, Red Rock Canyon, Death Valley, and many others. Valley Wells is just off the Death Valley road, known as the Jayhawker Trail, and a bronze placque, near there indicates where this weary party camped and rested on their way out of the desolate wastes of the desert. Searles Lake (made famous by American Potash and Chemical Co.), is sometimes called the "World's greatest stockpile of minerals." A great number of field trips, self-conducted, were made to various mines and mineral localities. Over-

night trips were made to Blue Chalcedony Springs and the Greenhorn Mountains in the high Sierras, as well as one day trips to Last Chance Canyon, Lone Pine and Darwin.

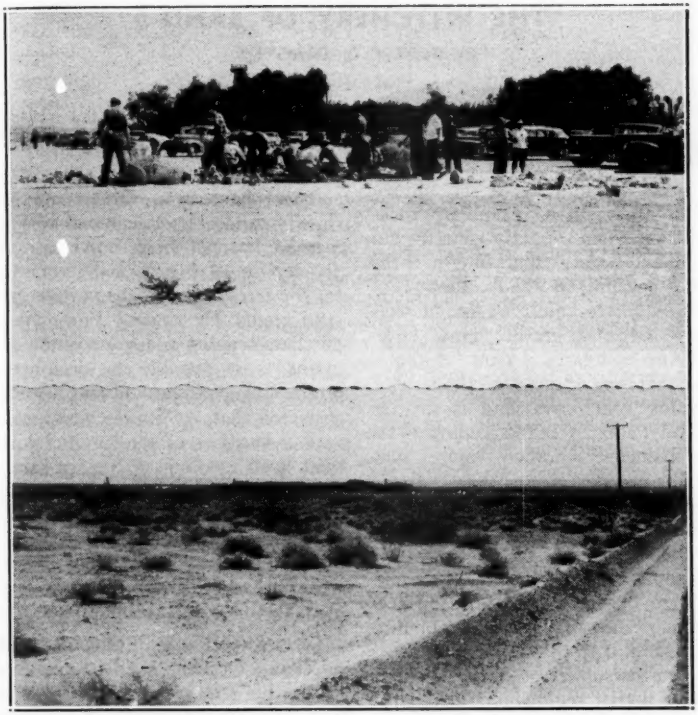
Two new societies were voted into the membership: Whittier Gem and Mineral Society of Whittier, Calif.; and Convair Recreation Association Rockhound Club, San Diego, Calif. A mammoth field trip is slated by the Clark County Gem Collectors of Nevada, and it is possible that representatives of the 55 California societies will take part in it on October 7 and 8, 1950. Paul VanderEike has retired, because of health reasons, from the editorship of *Mineral Notes and News,* after 11 years of work editing and managing the Federation's official organ. The Federation will miss his guiding hand, but wish him the best of luck in his new home near Vista, California.

The 1951 convention will be held in Oakland, California, on June 22, 23, and 24. Host society will be East Bay Mineral Society. Much of the success of the convention is due to the efforts of the committees that functioned under Ralph Mer-

Top—Dealers' Row under the "smoke" trees at Valley Wells, Calif.



Bottom—Campers Row at Valley Wells, Calif.



Top—A truckload of kernite and gold ore was dumped near the camp ground on a large concrete slab for visiting collectors to help themselves. Scene shows specimen "hunting" in the dumped material.

Bottom—On the Jayhawker Trail to Death Valley, Calif. In the distance is Valley Wells, scene of 1950 Convention.

rill of Searles Lake Gem and Mineral Society. Mr. Merrill was general chairman. Due to the efforts and cooperation of individuals as well as societies the entire meeting was a great success. Lack of space prevents the giving of all interesting details of this great convention, but the hundreds who attended, carried home memories which will not be forgotten soon.

LET'S HUNT FOR "HERKIMER DIAMONDS."

"Herkimer diamonds" are the most popular quartz crystals in America. Everybody likes them and every collector wants to visit the area where they are found so that he can collect them personally. If you have never been to the locality (in Herkimer County, N. Y.) a new booklet by Claude H. Smith, recently published, will be of great help to you. The booklet, "Let's hunt for Herkimer diamonds," is 4¼ x 6 inches in size, contains 47 pages, and is illustrated with photos and a map. Mr. Smith has collected the crystals for many years and is thus well familiar with their occurrence.

The booklet sells for $1.00 a copy and it may be obtained from the author, Claude H. Smith, Box 291, Geneva, N. Y.

THE WITCHERY OF SAND

By GEORGE C. OLMSTED
1129 James Blvd., Signal Mtn., Tenn.

The dictionary defines sand as: "A hard, granular comminuted rock-material finer than gravel and coarser than dust." But it gives no hint as to the hidden beauty in this "hard, granular, rock-material," yet when properly viewed sand has a radiant beauty, sparkling in brilliance and dazzling in vivid colors.

Getting a bit technical we might well ask, How large is gravel? How large is dust? And how large is sand? Authorities have different ideas as to the size of these grains. One[1] says sand is smaller than gravel (2 mm.) but exceeding 1/16 mm. in diameter. Another[2] figures that sand grains are not greater than 2.5mm. in diameter or less than 0.05mm., thus; coarse sand 2.5 to 0.75mm. Fine sand 0.10 to 0.05 mm.

Still another[3] classifies sand as: Coarse sand, 1.0 to 0.5mm.; Medium sand 0.5 to 0.25mm.; Fine sand, 0.25 to 0.10mm.; Very fine sand, 0.10 to 0.05mm.

While on the subject of size it is worth noting that detrial sediments are roughly classified[1] according to size in decreasing order as: boulders, cobbles, gravel, sand, silt and clay. That is, sand is a temporary condition of the everchanging rock-material, we catch it on its way from gravel to silt and thence to clay. However, this metamorphosis is not exactly a fleeting affair: the St. Peter sand is said to be Ordovician, about 445,000,000 years old.[4]

Sand Mentioned in the Bible

Perhaps the oldest reference we have to sand is in Genesis where the Lord tells Abraham that his seed shall be as the sand of the sea. The Old Testament has several references to sea sands. In the new Testament is the well-known parable of the house that was built upon the sand. But yielding sand has faithfully preserved ripple marks and cross bedding as well as the fossils of plants and animals. From the time when the first bearded Stone Age man threw sand in the eyes of his adversary, sand has been increasingly useful until today it would be difficult to compile a complete list.

Some Types of Sand

There have been various attempts to classify sands but acceptance of any one method has not been universal. W. H. Sherzer[5] in 1910 proposed certain criteria for the recognition of the various types of sand grains. He wrote: "From the physical characteristics and composition of sand grains is it possible to decipher their origin and geological history? It may be answered that *typical* assemblages of the various varieties of sand grains do reveal their own geological history, and that confirmation of this history may be obtained often from a detailed study of the beds in which these grains occur." His article proposed seven sand types and what he had to say is well worth reading. He offered the following types:

Glacial, Volcanic, Residual, Aqueous, Aeolian, Organic and Concentration. From this group he evolved sub-types such as Aeolo-residual, Aqueo-organic, etc.

Taking up one of these, the Aqueous, and following Sherzer's thought, he stated that Mackie found that the larger grains showed the most evidence of rounding; that where the grains were about of equal size the heavier were the more rounded; that where size and specific gravity were about the same the softer showed the more rounding. Sand that had traveled farthest was the most rounded. Assuming size, shape and distance traveled to be uniform, Mackie propounded this table showing relative capacity to become rounded:

Mineral	*In Water*	*In Air*	*Hardness*
1. Quartz	.23	.38	7.0
2. Orthoclase	.29	.40	6.0
3. Labradorite ..	.29	.45	5.6
4. Hornblende ..	.39	.57	5.6
5. Biotite	.70	1.05	2.5-3.0

6. Muscovite	.86	1.30	2.0-2.5
7. Magnetite	.70	.86	5.5-6.5
8. Garnet	.39	.53	5.5-7.5
9. Tourmaline ..	.30	.43	7.0-7.5
10. Zircon	.45	.59	7.5
11. Rutile	.51	.68	6.0-6.5

(Hardness column added by the writer). These figures mean that the capacity for being rounded in water is about 1 2/3 times greater for hornblende and garnet grains than for quartz, under the same conditions. The average amount of feldspar in river sand nearest the sea (in a certain test) was 18% while neighboring sea sands contained but 10%. The common minerals, softer than the feldspars, would be disposed of more promptly, and there results a gradual concentration of the quartz granules because of its hardness, specific gravity, lack of cleavage, insolubility, and ability of resist decomposition. By subjecting angular fragments derived from crushed granite, Daubree found that in a distance of 15.5 miles these fragments were indistinguishable from common river sand.

Uses of Sand by Indian Medicine Men

Referring again to the uses of sand, for generations the medicine men of the Navajo Indians have used sand in their stylized ceremonial sand paintings for the treatment of the physically and mentally sick[6]. Often they use for a background a red sand similar to that sent me by Mrs. Harry Ringstrom of Fallon, Nevada. This sand is from the Valley of Fire and comes from eroded red sandstone. Some of the rocks and cliffs are covered with prehistoric petroglyphs. It would seem that a sand from such a misty, silent past would surely have occult powers. With its mystery and antiquity it should be a powerful aid in the cure of a Navajo sick because some one cast a spell over him, or because a nearby tree was struck by lightning, or a snake crossed his path. And to the Navajos these treatments are real and are often said to be more effective than the white man's. In reflected light this sand appears rusty but polarized light brings out sparkling beauty undreamed of by those prehistoric people who drew those petroglyphs. This red sand is fairly well assorted but rather fine grained, subangular to rounded.

Another sand probably used by the Indians is the white sand of Alamogordo, N. Mex. (You may get a specimen from the Chamber of Commerce). This is gypsum sand, a concentration type according to Sherzer. The water of Lake Lucero is saturated with gypsum. In summer the heated air rises and is replaced by cool air from the summits of the San Andreas mountains to the west and sweeps down and across the lake. This causes waves and as the crests break, the evaporation is so rapid that gypsum crystals are formed and blown toward the east shore. Experiments have caught those monoclinic crystals in a blanket. But as the sand drifts eastward (the dunes move about 20 feet annually) the granules lose their crystal form and become sub-angular and rounded. My own particular specimen is slightly coarser than the Valley of Fire sand, is rather poorly assorted and but few grains have a straight cleavage side. This location is known as the "White Sands National Monument," and that brings up the question; when is white, white? Before me is a specimen of this sand and beside it is one from Sarasota Beach, Florida. The latter is noticeably whiter.

Again referring to Mrs. Ringstrom, in sending me a specimen from Singing Mountain she wrote: "This sand came across the hills and valleys from the Walker River delta. How many years it took to come this far one can only guess. You may look up the map for the distance. The trail of the dune is evident by the sand left along the way. On the mountain the sand is piled in deep folds and when one begins pushing the sand down the steep side it produces a rumbling not unlike a squadron of planes in the distance. One is aware of a sort of vibration. It certainly is an unusual experience. The Piaute Indians were very superstitious about the mountain and kept their distance." This sand is of various composition; some grains show cleavage; other are typically aeolian (Sherzer) much rounded with frosted and pitted surfaces; and the assortment is fairly uniform. This

is a beautiful sand under our home-made petrographic microscope.

Singing or Musical Sands

These so-called singing or musical sands have aroused interest for generations and superstitions for probably thousands of years. Nobody knows what makes singing sand sing. It is thought to be a function of temperature, moisture, pressure and perhaps the speed of the grains rubbing over each other. These sands[7,8] occur almost all over the world.

Sand from St. Peter Sandstone

The sand derived from the St. Peter sandstone is so unique that it has received much study. It has the typical shape and surface (frosted and pitted) that Sherzer assigns to the aeolian type of grain. Moore[9] states: "Thus, a very pure light-colored sandstone, 100 to 400 feet thick, that is widely distributed in the central and upper Mississippi Valley region, when examined under the microscope, is seen to be composed of unusually well-sorted and rounded grains of quartz having frosted surfaces. This deposit, known as the St. Peter sandstone, evidently represents extensive sorting of the sedimentary materials in which all but the resistant quartz grains have been eliminated, and it shows prolonged transportation during which grains have been very well rounded and the surfaces frosted by impact of grain on grain. Conceivably, the sandstone indicates the former existence in central United States of a Sahara-like desert where migrating sand dunes were spread by strong winds. On the other hand, perhaps the sand was laid down by water, being shifted by waves and currents of a shallow sea, or spread as beach deposits of such a sea. Possibly work by wind, stream, and a shallow sea all may have had a part in making the St. Peter sandstone." This sandstone is assigned to the Ordovician.

The cementing material of this sandstone is so weak that a stream of water reduces it to sand. It is then sifted or graded. It is so uniform at Ottawa, Ill., that the American Society of Testing Materials designates "C-190" for standard Portland cement tensile tests, and "C-109" for compressive tests. Certain sizes are used for sand blasting, glass making, filtering and foundary work. A given size under the microscope reminds one of eggs in a nest.

Oolitic Sand from Salt Lake City, Utah

But for really round grains examine the Great Salt Lake sand. I picked up a penny matchboxful at Bel Air, Salt Lake City, near the pavillion. Some of the grains are rod-like. According to Shimer[10] due to the agency of unicellular plants known as Blue-Green algae, these oolitic grains are formed. On the beach they appear grayish, by transmitted light they are opaque and dull or barely translucent, but by reflected light the microscope shows them to resemble pearls, well polished and some are veined in an irregular network like roads on a highway map. Sherzer classifies this type of sand grain as *organic* and includes as such forms that result from animal or vegetable life. The well-known *greensand* is included in this classification.

Mono-Mineral Sands

Another classification might be termed "mono-mineral" which would be comprised of such types as magnetite, garnet, monazite, atacomite, ilmenite, black tourmaline, etc. That is, certain minerals are found in grains and these accumulate as sands. There are a good many deposits of magnetite sand. Mr. Norman Radford of Couer d'Alene, Idaho, sent me attractive specimens of garnet and monazite sands. The garnets have lost their crystal form, are rounded, and are really almost gravel in size, running from 2 to 3mm. The honey-colored monazite shows straight cleavage on some grains, and on one a monoclinic pyramid. This sand is rather angular. I have no specimens of atacomite nor of ilmenite sand. Col. D. N. McMillin of Lookout Mountain gave me a specimen of Hawaii Beach sand that appears to be black tourmaline with some magnetite, and Mr. J. B. Warner, Industrial Mineral Dealer of Chattanooga, Tenn., has given me numbers of specimens, among them being one of zircon sand.

Sandstone Cast from Signal Mountain

There is a sort of pride one gets when

he is lucky enough to find an unusual or unique specimen, and I have this feeling about a sandstone cast of the interior of the hollow stem of a calamite. I was with Mr. Otto Gutenson, now with U.S.G.S., Denver, here on Signal Mountain. We were looking for coal mine fossils when I happened to find this cast. With a match a few sand grains were hollowed out. They were quite small and subangular, but a few grains were somewhat rounded. Long ago when my handful of sand filled this calamite, I remind myself there was not a flower in the entire world, there were no songs of birds nor flashes of feathers. There was no laughter. Odors of stagnant water and of rotting wood pervaded the swamps. Thirty-inch dragon flies and huge, 3-eyed dragon-like labyrinthodonts roamed about, each according to his kind. But my fossil was somehow safely tucked away for hundreds of millions of years while the Appalachians and eventually the Rockies were pushed up.

Oil Sand from Mississippi

The only oil well sand in my collection was given me by Prof. B. K. MacGaw of the University of Chattanooga. This sand came from Jackson County, Mississippi, from a depth of 4700 to 4900 feet. The grains are still brownish after washing with alcohol but most of them are transparent. They are generally subangular, some are rounded and a few show cleavage.

Sand from Italy

It is entertaining to associate events or persons with sand, as when just a year ago I picked up a matchboxful of sand in the Baths of Dioclese in Rome. In my mind I have connected this with the Apostle Paul who is said to have entered Rome through the south gate in the old city wall. Did St. Paul ever tread on my sand? *Quien sabe!* It is rather a dark gray with conspicuous black specs of magnetite. The composition is varied, some granules much rounded, others angular and showing straight edges.

In Venice we of course thought of "The Merchant of Venice" and walked across the Rialto. At our hotel a mason was at work, so naturally a portion of his sand got into my little matchbox. It is a lighter gray than the Roman sand, has no magnetite but has plenty of sea shell fragments. While viewing this through the microscope a drop of acid starts a "hot foot" sort of rhumba in a vigorous bubble bath. While in Venice we visited Pauley & Company's glass factory and there acquired a pinch of glass sand which came from—Fontainbleu, France! This is a well-known glass sand, quite a pure, fine-grained quartz. The smaller grains tend to be somewhat angular but many of the larger ones are rounded, thus leading to the conclusion that the deposit is the result of stream action.

Sand from France

On the French Riviera one's thoughts whirl through a quick succession of Monaco, Monte Carlo, Khan, Hollywood, stolen jewels, and the gravelly beach at Nice—a pain for tender American feet. Between the gravel coarse sand may be screened out through the fingers. It is of various composition with plenty of shell fragments.

Now get out your old Caesar. It probably has a map of the Brittany coast where the Roman fleet defeated the Veneti within sight of the town of Le Croisic. This queer little old town has a sort of pavillion on a granitic point jutting out into the Atlantic. The coarse sand has a pinkish cast due to the abundance of shell fragments. Perhaps some survivors of that ancient battle reached this point and lay exhausted on my sand. What are 2000 years to a grain of quartz!

Massachusetts Sand

Mr. Hans Thurnauer of Chattanooga has given me several sand specimens, among which are those of Gloucester and Provincetown, Mass. The former is darker, and rather uniform in size, while the latter tends to be coarse and bright. Occasionally one sees a bi-valve of pinhead size. Those of us who live far away from the New England coast somehow associate it with Priscilla, John Alden and the Pilgrims.

Coney Island, N. Y., Sand

In contrast to the quiet dignity of the Pilgrims, perhaps the Indians whooped, hollered and danced on Coney Island after they got the famous twenty-four dollars for that worthless Manhattan Island. This Coney Island sand somewhat resembles that of Gloucester but it is darker and has a few grains of magnetite.

Aqueous Sands

Concerning Aqueous sands Sherzer wrote: ". . . under the microscope they appear essentially alike and are not to be distinguished from one another." I have only a few river sands but without exception they lack shell fragments, while ocean beach sands almost invariably have an admixture of shell or coral.

Composition of Sands

And that brings up the question of composition of sands. Quartz is the most common ingredient for it is so plentiful and so durable. English wrote that "Any of the varieties of quartz may be reduced to sand, but as rock crystal, smoky and milky quartz are much the most common varieties, grains of these are most plentiful in sands than grains of any other varieties." But in some localities chert is the most common quartz. As all rockhounds know, quartz scratches glass, so quartz grains rubbed between two pieces of glass leave tell-tale marks. These grains are usually clear and glassy but may be stained by iron, or frosted by aeolian action.

One authority[2] writes: ". . . in regions where micaceous rocks abound, muscovite and bleached biotite may be in considerable quantity. Garnet, magnetite, zircon and rutile are also counted among the more indestructable minerals, but the last two are seldom abundant." Water or air transportation quickly frays micas to dust, but they withstand considerable weathering in place.

Garnet, being isometric, will show no change of color when turned in your petrographic microscope. If weathered or worn a complete crystal will appear dark, dull and spherical, while fragments are red and glassy.

The black magnetite grains are easily separated with a magnet. And a good magnet may often be had from a loudspeaker discarded by a radio shop. A few minutes' work with a hacksaw will free the magnet.

Hematite grains appear black or nearly black. When scratched or crushed they form a red, non-magnetic powder.

Ilmenite appears black. As a rock-making mineral it is generally in irregular platy, iron-black to brownish grains, which at times show two or three lines or faces of a hexagon. The crushed grains yield a brownish-black powder non-magnetic, which becomes magnetic when strongly heated in a reducing flame.

Seashore sand is generally broken down into *minerals* not *rocks*. Calcite and aragonite have the same composition ($CaCO_3$), but aragonite is orthorhombic while calcite is hexagonal. In seashells aragonite usually has a chalky, opaque composition, compact all the way through, while calcite is usually translucent with compact surface but porous interior. In carbonic acid it dissolves slower than aragonite, hence lasts longer in percolating waters.

There are something like 1500 minerals and any one of them may be found in sand. With such a vocabulary, sand is a wonderful conversationalist—if only we understand the language. It is to be hoped that other "sand hogs" will take pen in hand and tell us about Refractive Index media and Specific Gravity liquids, and perhaps to some extent explain how to make a petrographic microscope interpret for us.

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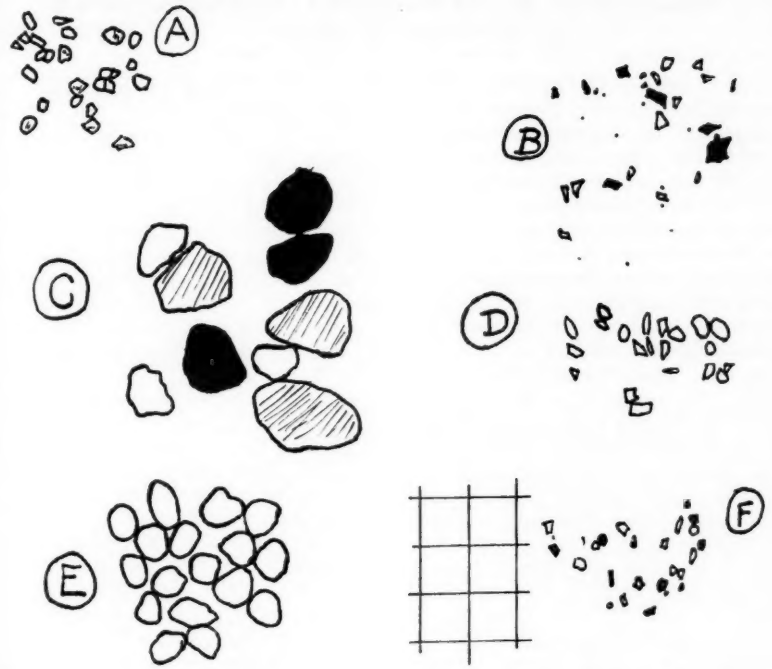

Various sand grains. They all have the same magnification; the squares are 1 mm. each side. A: Zandvoortbad beach, Netherlands. B: Lava field near Reykjavik, Iceland. C: Nice beach, France. D: Gypsum, Alamogordo, New Mexico. E: St. Peter sand, Ottawa, Illinois, designated as C-190, and screened between 20 and 30 mesh. F: Singing Mountain, Fallon, Nevada.

ZUGSPITZE, GERMANY'S HIGHEST MOUNTAIN

Zugspitze (9722 ft.), in the Wetterstein mountain range, is the highest mountain in Germany. Located in the extreme southern part of Bavaria bordering the Austrian frontier. From the summit can be seen with the naked eye five countries, Italy, Switzerland, France, Germany and Austria. Zugspitze is in the Bavarian Alps and is popular with mountain climbers. For the skier there is the natural bowl, Zugspitzplatt, where snow can be found 12 months a year. Climbers start their ascent from the nearby town of Garmisch-Partenkirchen (2295 ft). The summit can also be reached by a modern cog railroad which ascends the peak. The last 3 miles is thru a tunnel carved from the solid rock to reach the highest railroad station in Germany also carved out of the rock inside the mountain.

Recently Capt. and Mrs. Howard P. Graf (of Peekskill, N. Y.) who are stationed with the U. S. Army in Germany, made the trip to the summit of Zugspitze and collected three limestone specimens which were sent to ROCKS AND MINERALS. These specimens are dark gray in color, massive and all phosphoresce white under the Mineralight. (one specimen, a lighter gray, is the best of the three).

MALACHITE AT BRIDGEPORT, PENNSYLVANIA

By CHARLES A. THOMAS
706 Church Street, Royersford, Penna.

A great many words have been printed about the new huge stone quarry, operated, at present, for limestone and dolomite, by Bethlehem Steel. It is situated conveniently, on a first class motor route U. S. 202 famed as a ribbon of concrete which Peter Zodac could take at a point near Peekskill, and without leaving it, find himself, after a few hours good driving, at the threshold of the deep South—Baltimore—where it would be a sacrilege to eat anything but seafood.

On the West rim of Montgomery County, Pennsylvania, in the dolomite belt, is the thriving small city of Bridgeport on the West bank of the Schuylkill River, just across the bridge from the sprawling city of Norristown, the County seat, on route 202. Philadelphia claims that Norristown is a suburb. What a nerve! I can show any Philadelphian at least one farm between the two cities, though I admit the two cities would appear on a rocket photo nearly as one . . . somewhat like a tight waisted amoeba. And if amoeba had eyes, the huge hole in the ground, just west of Bridgeport would appear to be its eye.

Perhaps twenty or more years ago, many fine specimens of quartz groups with sheaves or bundles of brightest green malachite and masses of chalcocite and cuprite or bornite with a sprinkling of perfect fog colored (if fog has a color) rhombs of dolomite, or perhaps some very interesting saddleback crystals of dolomite, were collected and distributed to all parts of the globe. About ten years ago I received by mail, from Mr. Poole of Miquon, such a specimen; sharp clear quartz crystals divergently placed on a flattened loaf-shaped mass of Shenandoah limestone; the crystals, though not considered large, covered all surfaces of the mass and sprinkled, here and there, among the clear quartz points, were lovely green, tiny bundles of sparkling malachite.

Such specimens, naturally, caused a great determination on my part to visit this famous locality, which I did, many times. Did I find anything like Mr. Poole's specimen? I did not. Quartz groups, yes, and some very good museum type specimens; quartz with large saddleback and rhombic dolomite, but none with what I would call a fine malachite showing. Some quartz points were over one inch long and many over a half inch thick and in fine large groups, covering many square inches of flat rock surface.

I had found the particular spot, where the malachite-quartz-dolomite combination were to be expected. There were plenty of signs of malachite, you know the kind; mere specks that may or may not prove to be good micros. Perhaps a half dozen very fine micro clusters of the brightest green malachite were found in the intervening years of search.

Those who knew just where to look for possible malachite and quartz, will remember that the vein was exposed on the North wall perhaps a thousand feet or more from the quarry office or perhaps as many feet from the bottom of the ramp and on the first, or original level. Subsequent levels, there are several now, and quite deep, do not seem to produce any malachite at all, directly in line with the original vein. For years, the only possibilities for these interesting groups of crystallizations to show up were in the fact that huge unblasted masses of limestone were left untouched by quarrying operations, due to the fact that homes, close to the rim of the wall, were in danger if such masses were cap-blasted or drill-hole blasted.

Some weeks ago I thought of trying again for whatever might show up. In such an active quarry, something, sooner or later, of great interest and perhaps of great beauty should come to light. I have never gone into this quarry without first investigating the possibilities that frost action and rock falls may have exposed new specimens in the good old malachite spot. There were some! Whether rain or snow, or sleet or frost did the trick, I do not know, but there was a

new look to the pile of large rock masses. With a pounding heart, I took a good look.

About twenty fair specimens were taken out, showing fine clusters and individual sheaves of bright green malachite. But like fishing for bass or any other fish, the big ones got away or were so thoroughly inaccessible in deeper cavities of the really tough rock, that getting them out intact was almost impossible. I say "almost" because I have always felt that, like the convict, spending years of never ending toil with a silk thread on a cell bar and finally getting through, there must be a way to get out those beauties in deep cavities in hard, tough rock, without, like the convict, making a great racket with blasting powder, which, of course would shatter the delicate crystals, nine times out of nine.

The malachite, invariably, is perched divergently and very precariously, either on the smooth surfaces of the quartz crystals, or on more or less weathered matrix, the apex of the triangular or cone shaped bundles forming the contact with quartz or matrix. Blowing the breath on them will sometimes dislodge fine clusters. Chisel and hammer work is logically disastrous to such specimens, but, with some care, one can come away with fairly satisfactory results.

This new showing of the old time specimens is very limited. There are still some there for others to work on, and I mean WORK. Other than that there are some fine, clear quartz groups to be found at "the" spot and on the second level. I brought out some ten pounds of very light-weight, spongy masses just loaded with fine, prickly-porcupine like druses of clear quartz crystals, which, when washed in acid, will sparkle on the display shelf with great beauty.

No doubt, I will visit this interesting quarry again before winter, but I will refrain from trying for more malachite and quartz groups so that others may benefit from the short supply. There is a large vein of red clay on the second and third level in which there are, at times, large masses of white bull quartz, which are so full of spacious cavities that nice white to clear quartz points are inevitable. Half white to half clear points are the rule in this material (from the red clay vein).

New Microscope Speeds Examination of Ore Specimens

Rochester, N. Y. — Location of mineral deposits will require less time in the future'

A new microscope designed to enable mining engineers and geologists to make accurate, on-the-spot quantitative analysis of ore samples as they are taken from the mine has been developed by Bausch & Lomb Optical Company.

Opaque specimens measuring up to four inches square may be examined with polarized or non-polarized vertical illumination with the microscope which utilizes the phenomena resulting from the action of polarized light vertically projected on the polished surface of an ore sample.

Other features of the Ore Microscope which was produced after nearly two years' research, are its strain-free coated objectives that provide maximum light transmission, and its extra wide tube that houses and protects the rotatable analyzer from dust and dirt, even when it is withdrawn from the optical path.

Among the many ores that may be rapidly analyzed with the new microscope are those containing iron, copper, gold, lead, silver and uranium.

What's The Idea?

Editor R & M:

For several years we have had a small reserved space ad in ROCKS AND MINERALS. On our travels we are asked by both rock hounds and dealers, "What's the idea?" The idea is simply this, we do it to support our fine eastern magazine, ROCKS AND MINERALS.

We subscribe for all magazines pertaining to the Mineral Hobby, and they are all excellent, and we enjoy them. But we consider ROCKS AND MINERALS our home magazine and support it all we can.

James W. Riley
Springfield, Ohio

July 17, 1950

Renews Early!

Editor R & M:

Please send renewal blank so I can renew my subscription now before it runs out in December, 1950. ROCKS AND MINERALS is most interesting and I don't want to miss an issue and so it's best to renew early.

A. E. Anderson
Springfield, Ill.

Aug. 6, 1950

WORLD NEWS ON MINERAL OCCURRENCES

Items on new finds are desired. Please send them in.

ALABAMA: Hematite, black and reddish, slightly oolitic, occurs 30 feet beneath the surface of a knoll 1½ miles east of Center, Cherokee Co., Ala. Note from W. W. Ward, Center, Ala.

ARIZONA: We are indebted to Howard V. Hamilton, 187A Franklin Ave., Vandergrift, Penn., for the following item on 3 new uranium minerals found in Arizona. The item is from *Chemical and Engineering News,* April 24, 1950.

Observed, collected and identified, three new uranium minerals, just named andersonite, swartzite, and bayleyite. They were found in only one place as a coating about ⅛ inch thick on gypsum in the oxidized zone and about 40 feet above water level. Site: Arizona's Hillside mine, producer of gold, silver, lead, and zinc. The source of the uranium not known. But complete analyses, optical data, x-ray patterns and crystallographic data have been prepared to define the minerals. Another rare uranium mineral, not altogether new but previously found only in Wyoming and Czechoslovakia—schroeckingerite—was found at the Hillside mine at the same time.

(Editor's Note: The above mine is at Hillside, Yavapai Co., Ariz.)

In the May 29, 1950, issue of *Chemical and Engineering News* appears this interesting item:

Few people realize the work involved in a piece of research when that research is summarized in a sentence or two. The work that went into analysis and identification of the three new uranium-containing minerals recently (see above) is a nice example of teamwork. The U. S. Geological Survey is proud of the unusually difficult piece of research that was done by Charles Milton, J. M. Axelrod, F. S. Grimaldi, and K. J. Murata—a mineralogist, an x-ray crystallographer, a chemist, and a spectrographer.

ARKANSAS: Mr. Hamilton, of Vandergrift, Penn., sent in another item as follows:

Magnetite, important in making pig iron and steel, is going to be mined quantitatively at Magnet Cove, Ark.—first significant magnetite operation in the state. The deposit is estimated to contain between 75,000 and 150,000 tons of ore. Magnet Iron Co., will do the mining and plans to produce a minimum of 500 tons of concentrates a day. Shipment of the ore—to analyze at least 54% Fe_2O_3—will be to Republic Steel Co. of Birmingham, Ala., for use in open-hearth furnaces. Concentration will be relatively simple—involving a log washer, screening, and magnetic separation of the material mined at depth and less weathered than the bulk of the residual ore.—*Chemical and Engineering News,* June 12, 1950.

(Editor's Note: Magnet Cove, in Hot Springs Co., Ark., is one of the world's great mineral localities. It is especially famous for its lodestone (a variety of magnetite which is the ore that will be mined) and huge amounts of this lodestone have been collected and dispersed among collectors and museums throughout the world. It is this magnetite which gave the name to the locality.

CALIFORNIA: A unique mineral that is seldom seen in collections is mountain cork, a variety of amphibole. In California, mountain cork is found in whitish, cork-like masses at Blythe, Riverside Co.

COLORADO: In the last issue appeared a short item relative to quartz crystals (milky and rock crystal) found at Hans Peak, Colo., but the location of Hans Peak was not known and it was asked for. It is a pleasure to print the following, sent in by Prof. Richard M. Pearl, Dept. of Geology, Colorado College, Colorado Springs, Colo.

"The locality to which you refer on page 378 is undoubtedly the Hahns Peak area in Routt County, northern Colorado. It is not usually especially noted for specimen material. Situated away from main roads, it can be reached by side roads. It is a cold and snowy place in winter. Hahns Peak reaches 10,500 feet in elevation.

"This was once a placer gold mining region. Some rich gold-silver-copper-lead ores have been found here, but most production has been low grade. The rocks are sediments and small igneous bodies, on a foundation of ancient granite and schist."

CONNECTICUT: A recent visit to the famous essonite (garnet) locality at Redding Station, Fairfield Co., Conn., disclosed an astonishing large amount of broken up material—work of collectors. The locality is a ledge of solid essonite and the area was strewn with broken up essonite, all of good quality but chiefly massive.

The trip was made Thursday, August 3rd, 1950, with Mr. J. E. Farr, of Downers Grove, Ill., and in a heavy rain but fortunately the heavy foliage helped to shield the collectors. Some very nice crystals of essonite (a number of gem quality) were found by Mr. Farr which helped to compensate him for the wetting received. (See the paragraph about England, in this issue, for an interesting item about Mr. Farr.)

DELAWARE: We hear very little these days about minerals being found in Delaware but over 100 years ago quite a number were found and recorded of which one was agatized wood. Parker Cleaveland, in his "Elementary Treatise on Mineralogy and Geology," Boston, 1822, stated that the agatized wood was found near Cape Henlopen, Delaware. (p. 264).

Cape Henlopen (at the entrance to Delaware Bay) projects into the Atlantic Ocean off the eastern coast of Sussex Co., in southeastern Delaware.

Here is an opportunity for some active collector to visit the area and do a little exploring—he might find more agatized wood. If a collector does visit the area and does find something, will he please send some notes on his finds to ROCKS AND MINERALS?

FLORIDA: Wavellite, as grayish radiating masses and small botryoidal masses, both on phosphate rock, are common in the phosphate deposits at Dunnellon, Marion Co., Fla.

GEORGIA: Bob Daniel, of Toccoa, Ga., has been cutting Georgia gem material recently with a great deal of success. He has cabochons of moonstone from Stephens County, which are unusually good; also, rutilated rose quartz from the property of J. Swanton Ivy, near Watkinsville, and two matched emerald-cut amethysts from the old amethyst mine near the new waterworks dam at Mountain Ciy, Rabun County, Ga. He has a yellow cabochon of unusual beauty, which he cut from a dense jasperoid-type of silica, showing very fine, delicate banding and found at the old Laurel Creek corundum mine, Rabun County. The prize of the lot is opalescent rose quartz from the Kell mica mine in Rabun County. This quartz was first cut into a sphere, then backed with a blue mirror. The six-rayed star is extremely conspicuous in direct light, rivalling that of the star sapphire. —Georgia Mineral Society *News Letter*, July-August, 1950, p. 144. (425 State Capitol, Atlanta 3, Ga.)

IDAHO: Red and brown jaspers are common in the area east of Little Wood River, Blaine Co., Idaho.

ILLINOIS: Nice specimens of reddish microcline (in pegmatite pebbles) have been found in Mazon Creek, Grundy Co., Ill.

INDIANA: A letter to the Editor of R & M from Walter Reeves, R 3, Greencastle, Ind., dated June 22, 1950, reads as follows:

"My son, while fishing along Big Walnut Creek 5 miles north of Greencastle, Ind., noticed a band of shale about a foot wide and 75 to 100 feet long in a limestone bluff along the creek.

"Examination showed it to contain small geodes—no large ones.

"I am mailing you a few so you can see the variety of minerals found in so small a geode bed. You will notice some are flattened—that is because they occur in clusters of 4 or 5.

"I have hundreds of Indiana geodes in all kinds and color. Clear quartz ones, milky quartz, fluorescent calcites, dog-tooth calcite, chalcedony in many colors, gypsum, dolomite, pyrite, etc. One I found at Harrodsburg, Ind., recently is an oddity. It is about 5 inches in diameter and is coated inside with smoky quartz crystals.

"If you ever get near Greencastle (40 miles west of Indianapolis,) drop in and see what Indiana has in the geode line."

Among the minerals found in the geodes from Big Walnut Creek are: ankerite (brownish crystals), barite (platy grayish crystals), dolomite (pale brownish crystals), kaolin (white earthy coating on quartz, etc), pyrite (tiny striated cubes, dark brown in color), quartz (milky-white crystals), and sphalerite (black-brown crystals). The geodes are very nice, are all quartz lined with one or more of the above minerals in each geode which vary from 1 x 1 up to 2 x 3 inches in size.

IOWA: Petrified wood (dark brown pebbles 1 x 1 to 1½ x 2 inches in size) have been found in gravel at Emmetsburg and Graettinger, both in Palo Alto Co., Iowa, by A. F. C., Heiser, Box 165, Fairmont, Minn. The specimens are of good quality, free from cracks, and should take an excellent polish.

KANSAS: Agate pebbles, banded, dark gray and bluish, have been found in Wabaunsee Co., Kans., but the exact locality is not known.

KENTUCKY: Nice white masses of cleavable calcite occur at the Delhi-Babb fluorite mine near Salem, Livingston Co., Ky.

LOUISIANA: In the summer 1950 issue of *Monsanto Magazine* (Robert C. Bullen, Editor, Monsanto Chemical Co., St. Louis, Mo.) there appears on pages 29-30 a most interesting article on the Morton Salt Co. mine at Weeks, La. Excerpts from the article are as follows:

"There are Chinese salt mines which have been worked since 300 B.C., but so old are they that no one actually knows when they were discovered. The Wieliczka mine at Galicia, Poland, has been worked since 1000 A.D. It is famous for the most elaborate underground salt installations in the world. It has chapels, ferry boats, and a railroad with stations. (p. 29).

"The extent of these underground deposits (of salt) formed by early seas which have dried up or moved through upheavels of the earth, has never been determined. As far as scientists can judge, the salt has always been there in quantity and always shall be.

"Such a deposit, or dome, is the Morton Salt Company unit at Weeks, La. Here deep under the earth are gigantic rooms, palatial in their scope, astounding in their quiet. One feels an almost reverent quality as he walks through the still, cathedral-like caverns from which the salt is mined. At Weeks the shaft is sunk a full 600 feet below the surface, a breathtaking descent in the elevator which is used not only for men but for the salt bound upwards. As you drop and look up through the tiny hole through which you came, it grows smaller and smaller and slowly you begin to feel a warm slightly oppressive humidity. There is the impression that perhaps the atmosphere is pushing you slightly from all sides. There is an indistinguishable and faint odor and the heat is comparable to that given off by a steam radiator. Strangely enough, the mines are dry and as you walk along with the crushed salt underfoot reminding you of beach sand, the constant 77 degree of temperature slowly begins to seem natural. Your nose and throat seem clearer and the foreman tells you that salt miners almost never have colds or any other respiratory tract troubles.

"Perhaps as impressive as anything is the cleanliness of the mine. The gleaming, many faceted crystals when touched by

light reflect and shine, and whiteness is all about. Equally impressive is the uniformity of the walls' absolutely level surfaces, mile after mile. Expert blasting is the story here. The blasters are so familiar with dynamite that there are entire 50-foot areas where the deviation in the walls is no more than an inch or an inch and a half.

"For safety and convenience, blasting is done at night, and in the morning large conveyor equipment moves in, scooping the loosened salt into little cars, for a miniature railroad runs beneath the earth. At the Weeks installation, for example, there are nine miles of passageways.

"Above ground you see brightly colored blocks, roughly a foot square, stacked heap upon heap. Some are pure salt for cattle to lick, others are salt and sulfur of another color, still other are salt with trace elements added so that the livestock will, in satisfying one natural need, fulfill their other requirements."

Weeks is in Iberia Parish of southern Louisiana.

MAINE: Autunite, as greenish scales on pegmatite, is found in the pegmatite quarries at Topsham. Sagadahoc Co., Me. The autunite fluoresces green under the Mineralight. A nice specimen was donated to R & M by I. S. Skillin, of Freeport, Me.

MARYLAND: A letter dated July 9, 1950, from Jack Kepper, 5100 Belle Ave., Baltimore 7, Md., gives the following interesting information:

"This week Mr. Charles Ostrander of the Maryland Natural History Society discovered a new opening in the famous Cockeyville marble. It is situated in the center of the Marriotteville Flagstone formation in Baltimore County. Today we visited the opening and returned with large masses of blue-green apatite, a few rough crystals of apatite, masses of graphite, brown tourmaline, marcasite, pyrrhotite, and some feldspar. Continued digging should bring more new finds to light."

A letter dated June 19, 1950, from John D. Glaser, Jr., 2407 Chesterfield Ave., Baltimore 13, Md., gives information on a new find in the state. A paragraph from the letter reads:

"I think you might be interested to know that an interesting new mineral for the state was uncovered at the State Line Chrome Pits near Rock Springs, Md., on a recent collecting trip taken by Harold Levy, Crawford Isaacs, Edwin Sharp, and the writer. The mineral, a green variety of the garnet grossularite, has never been recorded from the state of Maryland before. It occurs as small emerald-green dodecahedral crystals. Several specimens were collected. Some collectors who had visited the locality recently, had dug up the dumps rather thoroughly and uncovered the crystals but had overlooked them."

Under the assumption that the green mineral might be uvarovite (calcium-chromium garnet), a sample was sent to the Maryland Geological Survey, Johns Hopkins University, Baltimore, Md. for identification and their report is as follows:

"The bright green mineral in the rock sample submitted with your letter of May 4 appears from optical and x-ray study to be a variety of garnet. It is not however uvarovite, the green chromium garnet, but most likely a green variety of grossularite. The dodecahedral crystals you mention are also indicative of the mineral being garnet.

Michael Fleischer,
Chief Investigation Section,
Geochemistry and Petrology Branch

MASSACHUSETTS: Gunnar Bjareby, 147 Worthington St., Boston 15, Mass., reports that collecting at the old abandoned emery mines at Chester, Hampden Co., Mass., was very good recently because an old railroad bed had been worked on to serve as aqueduct.

In the last issue, Mr. Edward C. Foster, 15 North St., Williamsburg, Mass., had an item (p. 379) that the Betts manganese mine at Plainfield, Hampshire Co., Mass., was to reopen. He has sent R & M a number of minerals from the mine which are as follows: Amphibole (fasciculite), radiating black crystals in mica schist;

clinochlore, greenish plates with brown massive spessartite garnet; garnet (spessartite), tiny brownish gemmy crystals on quartz; pyrite masses; and pyrolusite, black, earthy, on quartz.

By a coincidence and just a few days prior to the arrival of the above minerals from Mr. Foster, Raymond Conover, Stone Ridge, N. Y., sent R & M a thin slab of rhodonite from the Betts mine. It is a beautiful specimen, deep pink in color, and was slabbed from a large mass that he had collected on May 6, 1933, on a field trip to the locality of which the Editor was a member.

MICHIGAN: Nice pebbles of amethyst are found at Agate Harbor, Keweenaw Co., Mich.

MINNESOTA: Dark brown pebbles of petrified wood have been found at a number of localities in the state by A.F.C. Heiser, Box 165, Fairmont, Minn. Among the localities are Blue Earth Co. (State gravel pit on State Highway 83, between Judson and Cambria); Martin Co. (shore of Martin Lake, at Fairmont, and northwest of Welcome); Watonwan Co. (near St. James); Winona Co. (gravel pit north of Winona).

MISSISSIPPI: Ironstone concretions, lenticular in shape and light gray in color, occur in the clay beds around Ackerman, in Choctaw Co., Miss.

MISSOURI: C. S. Harrington, R 1, Camdenton, Mo., sent R & M a number of cherts taken from the brook bed on his property. The cherts are grayish masses, some of which contain tiny black dendrites (pyrolusite). A loose fossil clam, 1½ x 2 inches in size (grayish but stained brown by limonite) was also included and it too comes from the creek bed.

Camdenton is in Camden Co., in central Missouri.

MONTANA: Fine specimens of Iceland spar (calcite) come from Greycliff, Sweetgrass Co., Mont.

NEBRASKA: Nice specimens of black, opalized wood used to be found in the Bad Lands of Nebraska. Can any reader furnish some information on the occurrence?

NEVADA: Green beryl is found in the tungsten mine in Oreana Canyon, near Oreana, Pershing Co., Nev.

NEW HAMPSHIRE: A letter dated July 25, 1950, from Gunnar Bjareby, 147 Worthington St., Boston 15, Mass., contains information on some interesting minerals found by him.

"So far this year I haven't found any extraordinary minerals except perhaps two choice bertrandite xled specimens in New Hampshire at the Beryl Mt., in So. Acworth, and last Sunday I found a very good group of brazilianite xls in Newport, N. H.

"Incidentally you might mention that twinned amblygonite xls and beryllonite xls have been found at the Smith quarry, Newport, N. H., recently (by yours truly)."

NEW JERSEY: A new occurrence for natrolite, andradite, and allanite, is a porphyritic nepheline syenite dike located one mile slightly southeast of Wykertown, Sussex Co., N. J. Masses of glassy crystallized drusy natrolite containing small crystals of green andradite and dark brown allanite occur in the weathered debris of the dike. This occurence has been described by Charles Milton and Norman Davidson in the *American Mineralogist*, July-August, 1950, pp. 500-507 (Dr. Walter F. Hunt, Editor, University of Michigan, Ann Arbor, Mich.)

NEW MEXICO: M/Sgt. C. B. Simmons, Philco Corp., 22 & Lehigh, Philadelphia, Pa. (formerly of Denver, Colo.) called at the offices of R & M recently, bringing with him a number of western minerals. One of these minerals was ricolite of which he had quite an assortment; it comes from near Red Rock, New Mexico. Mr. Simmons not only left a number of specimens but he was good enough to supply us with some notes on the locality which is the only one known for ricolite.

The ricolite is found on the west bank of the Gila River up a gulch called Ricolite Gulch, (about 6 miles northeast of Red Rock post office in Grant Co., N. Mex., to where you enter the gulch). Ordinarily you can drive up the gulch over the bottom of the dried up stream, about 2 miles, till you come to the spot where the gulch is so full of large boulders that you cannot go further although the gulch continues on. Here you park the car—many of the large boulders are ricolite.

Here are 2 veins of ricolite, 15 to 20 feet wide. You can trace them from one bank to the other and across the floor. Best picking are the loose blocks that have weathered out of the veins. Mr. Simmons collected one boulder that weighed 180 lbs. Boulders of ricolite are all around, some range up to 2 tons in weight, and they extend all the ways down the gulch.

Ricolite is a greenish serpentine but it exhibits yellow, blue, green and black of various shades and nicely blended in a banded combination. The mineral received its name, *ricolite,* from the Spanish word *rico,* rich, in allusion to its rich green color.

In wet weather, cautions Mr. Simmons, one must stay out of the gulch as it may be full of water, 6 feet deep. (this may occur once in a long time).

NEW YORK: On Thursday, August 3 1950, J. E. Farr, of Downers Grove, Ill., and the Editor of R & M, visited the abandoned dumps of Aqueduct Shaft No. 8 in northern Putnam Co., N. Y. It was raining and so too much time could not be spent at the locality. The dumps are exceptionally large, extending for hundreds of feet, and contain many minerals as actinolite, allanite, biotite, epidote, garnet, hornblende, microcline, quartz, etc. Bluish quartz was especially common and being wet (due to rain) its color was enhanced so that it was most conspicuous and looked very attractive; when dry the bluish color fades so that the mineral is not so appealing. The locality would be an ideal spot for a club field trip.

Raymond Conover, Stone Ridge, N. Y. sent R & M a nice sawed slab of quartz conglomerate which contains milky quartz, (some stained red by hematite), green mica, etc. The specimen was found on the High-Falls-Mohonk road (from some recent reconstruction work), Ulster Co., N. Y.

NORTH CAROLINA: Gemmy moonstone (albite) is found in the Rock Creek section, near Bakersville, Mitchell Co., N. C. Some beautiful cabochons have been cut from the moonstone.

NORTH DAKOTA: Interesting dark brown limonitic sand concretions known as "petrified popcorn" have been collected at Moffitt, Burleigh Co., N. D., by Mrs. Paul A. Bens, Box 664, Aberdeen, S. D.

OHIO: E. H. Sarles, 2026 Elm Ave., Norwood 12, Ohio, informs R & M that agates are found in large gravel pits at Newtown (suburb of Cincinnati), Ohio.

F. R. Klink, 1440 Bryan Ave., S. W. Canton, Ohio, sends in the following item:

"I have received word of a fossil locality not far from here that I want to explore in the very near future. It consists of what I take to be lily stems, these have a black star center which runs all the way through. I have examined some of these and the star is a perfect 5-point. Should I be lucky to find any specimens, I will send you one or more."

C. O. Getting, 2001 Starr Ave., Toledo 5, Ohio, is with us again with the following contribution:

"Another box of Ohio minerals is on the way to you. If you don't mind, I like to keep the readers of R & M informed on the hunting in our district. Many think as I did at one time that we have little in this region. I am constantly surprised—new forms, colors, and locations.

"First, at the suggestion of a truck driver friend I visited an old quarry at Holland, Ohio. This quarry, while very large showed few pockets in the walls, in fact a walk around the whole quarry showed only 5 in the old walls, 4 were too high to explore. The one I could

reach held large colorless xls some measuring 4 inches. On the opposite side of the quarry among the debris of a recent blast, I found the prize. These calcite xls are long prismatic with pointed termination. I am still trying to find reference to this type in my tert books.

"After the surprise at Holland, I decided to explore an old quarry near Silica, Ohio. This quarry appears to have been flooded for some time and recently pumped out and reworked. Several pockets in the old wall produced the largest calcite xls I have seen from this region. The largest single xl is 5 x 7 inches and the largest double termination is 8½ inches long. The type limestone and the mud pockets in which the calcite xls are found resemble Monroe, Mich. The fluorescence is a much darker pink and sometimes orange. A slight trace of pyrite was the only other mineral seen.

OKLAHOMA: Dark red, cellular, fossiliferous hematite, occurs near Thackerville, Love Co., Okla. A nice specimen from the locality was sent R & M by L. H. Bridwell, Forestburg, Texas.

OREGON: Superb and rich crystalline masses of petzite have been found at the Cornucopia gold mine, Cornucopia, Baker Co., Ore. The petzite is in white massive quartz and interstitially with large clear quartz crystals, making magnificent cabinet specimens.—*The Mineralogist*, July-Aug. 1950, p. 372. (Dr. H. C. Dake, Editor, 329 S. E. 32nd Ave., Portland 15, Ore.)

A nice specimen of common opal, mottled red, brown and white in color, from Klamath Falls, Klamath Co., Ore., was donated recently to R & M by R. F. Henley, 4075 19th St., San Francisco 14, California.

PENNSYLVANIA: Nice specimens of aragonite (tiny globules of white acicular crystals with colorless calcite crystals on dark gray limestone) and barite (tiny white crystals with calcite crystals in limestone) have been found in the Showalter limestone quarry, 0.3 mile northwest of Roaring Springs, Blair Co., Penn., by Howard V Hamilton, 187A Franklin Ave., Vandergrift, Penn., specimens of which have been donated to R & M. Incidentally Mr. Hamilton donated also a copy of "Recreation Guide to the Pittsburgh Region." This is a 108-page publication, 5½ x 7¼ inches in size, and illustrated with many maps and photos. The Guide gives interesting information on cities and towns of the region, parks, caves, historic places, etc. Published by Recreation Conservation and Park Council, 508 Magee Bldg., Pittsburgh, Penn. Price 50c.

RHODE ISLAND: Nice loose rock crystals, 2 inches and over in length, have been found at Lincoln, Providence Co., R. I.

SOUTH CAROLINA: Black lustrous nodular masses of psilomelane have been found near McCormick, Abbeville Co., S. C.

SOUTH DAKOTA: A bluish massive variety of apatite is found at the Hugo feldspar mine, Keystone, Pennington Co., S. D.

TENNESSEE: Nice specimens of massive chalcopyrite, brassy-yellow in color but often tarnished bluish, are found in the copper mines of Ducktown, Polk Co., Tenn.

TEXAS: Interesting pebbles of oolitic quartz, brown in color (iron stained white quartz) have been found in the northeast corner of Jack Co., Texas, by L. H. Bridwell, Forestburg, Texas.

UTAH: Dr. A. L. Inglesby, of Torrey, Utah, donated to R & M a nice specimen consisting of white crystals of apatite associated with martite; locality is Twin Peaks, Millard Co., Utah.

VERMONT: Grayish crystals of ankerite, in chlorite schist, occur at Windham, Windham Co., Vt.

VIRGINIA: A letter dated July 16, 1950, from William J. Foster, 3100 Lee Blvd., Arlington, Va., gives us the following note:

"An old marble quarry, long abandoned, near Zion Church (Mountville),

Loudon Co., Va., has recently been reopened by the Virginia Lime and Marble Co. This quarry was formerly worked for the white marble only, all colored material having been discarded. However, at present all colors are being taken for use in variegated terrazzo work. In addition to the pure white marble, that veined with and mottled with gray-green is to be found, also lemon-yellow, orange-pink, and solid gray-green. Minerals associated with the marble are as follows:

Calcite: In veins cleavable into rhombs, white and orange-pink.

Magnetite (*in calcite*): In octahedral crystals up to ¾" on a side; also massive, splendent. Some crystals have brilliant iridescence on surfaces, also some of the more unusual crystal faces occasionally occur as the dodecahedron.

Garnet (*variety undetermined*): Medium brown to very dark, nearly black. On contact zone between serpentine rock and calcite. Crystal faces in the calcite are very sharp and perfectly developed. In individual crystals up to about ½".

Clinochlore: Very perfect crystals up to ½" across in calcite. Also in brilliant dark green lamellae in veins and masses in calcite.

Serpentine: Massive, common gray-green, and translucent yellow resinous (retinalite).

Actinolite: Fine acicular in radiating masses on clinochlore and in calcite, light green color.

Asbestos (*Serpentine?*): Fibrous up to 3" long.

WASHINGTON: Dark gray masses of native arsenic have been found near Loomis, Okanogan Co., Wash.

WEST VIRGINIA: Dark brown geoditic masses of limonite have been found near Charleston, Kanawha Co., W. Va.

WISCONSIN: Fred Knowlton, Bayfield, Colo., sends in the following item on a zinc ore occurrence in northern Wisconsin.

"A very fine zinc ore, consisting of smithsonite and hemimorphite, was found about 10 miles up stream on Bad River from Odanah, Ashland Co. Indian Reservation. A passable road, except in early spring, runs from Odanah south. On east side of Bad River about 8 miles south there is a road breaks off (right) west and go to ½ mile of the Bad River. Leave your car here. Take trail to rapids (used to be a water falls here but was blasted out to clear stream so logs could be rafted through to Lake Superior). Follow trail on stream bank—up stream about 2 miles there is a slate outcrop and it is in this slate that the seam of zinc ore was found. There is probably plenty good collecting material here yet but will have to cut into bank.

"The hemimorphite is very fine, consists of pink radiating xls from ¼ to ⅜". The smithsonite consists of gray bright xls, the whole is in fine calcite xls. The whole makes a very fine specimen and different from the average zinc ore."

WYOMING: M/Sgt. C. B. Simmons, of Philadelphia, Pa. (see New Mexico, this issue) informs R & M that the famous Sweetwater moss agate is found loose on the surface in a large depression (no where near a stream) in Sweetwater Co., Wyo.

ALASKA: William Freiter, c/o Drake Puget Sound N.O.B., Adak, Alaska, has sent R & M a nice gem quality gray chalcedony pebble (Alaska "moonstone"). The pebble comes from Attu Island, in the Aleutians of Alaska.

Hugh McCrory, Good News Bay Mining Co., Platinum, Alaska, sends in the following item:

"I'm drill panning on a continued platinum exploration for the Good News Bay Mining Co. at Platinum, Alaska. They have a Yuba dredge here, 8 cu. ft. buckets —94 bucket digging ladder. This is a very rich deposit and no frozen ground. Minerals recovered are platinum, gold, iridium, rhodium, palladium, osmium and ruthenium.

"This is without question the most up to date and modern camp in Alaska, if

not in the world, for such a remote location. All new buildings and dwellings which are kept in first class condition. Drilling reports to date show at least 30 years dredging. Weather conditions here are very good for the North Country. Mining season runs from around April 1st to Nov. 1st. Lots of room to prospect up here. This is the last frontier!"

Mr. McCrory was good enough to send R & M some nice samples of native platinum from the locality; the samples consist of nuggets and dust.

ARGENTINA: Ellis C. Soper, of Franklin, N. C., is building some cement plants in the Patagonia region of Argentina. He has done some travelling too, during the past few months, and collecting specimens when opportunity permits. A letter dated March 11th, 1950, and sent to the Ed. of R & M from Franklin, N. C., contained the following interesting information on some Patagonia minerals:

"Referring to your letter of March 6th. The Aerolites are found about 170 kilometers west of Comodoro Rivadavia, which is in the Province of Shubut about 1200 miles south of Buenos Aires. They are found out on the pampas where it is extremely dry, the rainfall being only a few inches a year, sometimes none. They occur from ¼" size to two or three inches. They are generally black and show intense heat and pitted all over the surface. I have forgotten the name of the Professor from the Chicago University who visited the place quite some years ago, but he pronounced them Aerolites.

"I have just returned from my third trip to Argentina since August and this time while prospecting for cement materials in connection with a cement plant we are building in Patagonia, I discovered an extensive deposit of geodes. I have shipped several hundred pounds to the States and when they arrive, I shall be pleased to send you one that is broken and one that isn't.

"I also visited a so-called petrified forest about 150 kilometers west of Comodoro Rivadavia in a real desert of sand and clay dunes where I took some beautiful colored photographs—some of them really deserve framing and if you wish, I will have one printed and sent to you for your office. I shipped back several nice pieces of the petrified wood. This is not the agatized variety as in Arizona, but it is very nice. Next time you come south, you will have to see my collection, which has grown considerably since you were here."

Another letter dated Aug. 1st, 1950 and sent to R & M direct from Patagonia (arrived Aug. 7th) reads as follows:

"I returned from the Philippines, Hongkong, Korea, and so forth on the 1st of May, coming here direct.

"I hope to be back in the States sometime late this month or the first part of next month. When I do finally reach home for a sufficient length of time, I will pack up a box of specimens which I think will interest you.

"Regarding the petrified forests in Patagonia, I have located four of these, and will send along a rough sketch map of their location.

"The colored photographs of the petrified forests came out very well and as soon as I return to the States I will have some of these printed and sent you.

"I wish I had time to write you something about my explorations here, but this will have to wait until I have time and am at home."

When the minerals arrive, they will be announced and described in R & M.

AUSTRALIA: Tiny emerald crystals, but of gem quality, have been found at Emmaville, N.S.W., Australia.

AUSTRIA: Kyanite, in nice blue platy masses, occurs at Oelgruben-Joch, Pitztal, Tyrol, Austria.

BRAZIL: Bluish crystals of sapphire are found in Itapicuru, Bahia, Brazil.

CANADA: Pure masses of bornite can be found at Whitehorse, Yukon Territory, Canada.

CUBA: Lustrous flakes of graphite occur in schist at Trinidad, Santa Clara, Cuba.

EGYPT: An interesting three-faced wind-blown pebble known as a dreikanter, was recently donated to R & M by Dr. C. H. Barlow, Ministry of Public Health, Cairo, Egypt. The specimen comes from Sinai Peninsula on Eastern Gulf of Suez, 100 kilometers from Suez, Egypt, and was collected by Dr. Barlow.

ENGLAND: In England, a geologist of Bristol University, reportedly discovered a lode 14 miles long, 6,000 feet underground, estimated to contain 40,000 tons of uranium. If this British find meets expectations, it's close to being the largest in the world.—*Chemical & Engineering News,* June 19, 1950.

J. E. Farr, 5401 Webster St., Downers Grove, Ill., with Mrs. Farr and daughter, Miss Rosemary, spent a few weeks in Europe this past summer visiting England, France, Switzerland, Italy, etc. Being a rockhound, Mr. Farr collected a number of specimens in each country which could be polished. On returning to America, via the Cunard Line, they picked up their car in New York City (kept by a friend) and headed for home, stopping enroute in Peekskill, N. Y., to call on the Editor of R & M. What was supposed to be only a brief visit stretched to 1½ days so as to permit the Farrs to visit some localities at which many specimens were collected. The evening of Wednesday, August 2nd, was spent in examining some of the many specimens collected in Europe.

In England, Mr. Farr collected a number of flint (quartz) pebbles on the beach at Littlehampton, Sussex; gray oolitic limestone from Gloucester, Gloucestershire; and a number of others.

FRANCE: In Paris, France, is a famous park known as Jardin des Tuileries. This park has many pebbles, loose in the soil, and a number of them were collected by Mr. Farr. These pebbles were brownish, translucent common opal and grayish chalcedony.

Dr. P. Staehelin, 64 Bernerring, Basel, Switzerland, sent R & M a very interesting specimen from a gypsum mine located 2 km. west of Bergheim (N.W. Colmar), Alsace, France. The specimen consists of tiny tarnished cubes of pyrite on dark gray gypsum. The mine is situated in the foothills of the Vosges in the Keuper formation.

GERMANY: Nice specimens of torbernite (deep green scales on limonitic stained rock) have been found at Reichenbach, Saxony, Germany.

INDIA: Handsome specimens of lustrous, milky-white drusy quartz, on large milky quartz crystals, have been found in the basalt at Poonah, India.

IRELAND: Chiastolite (andalusite) is found in crystals in mica schist, in County Dublin, Ireland, near Killiney Bay.

ITALY: Hyalite (opal) as colorless crusts on orthoclase and smoky quartz, has been found at Baveno, Piedmont, Italy. The hyalite fluoresces green under the Mineralight.

JAPAN: Small crudely crystallized dark grayish native arsenic is found at Akatani, Echizen Province, Honshu Island, Japan.

KOREA: Prof. K. Ohmori, Tohoku University, Sendai, Japan, sent R & M a nice sodalite specimen (bluish mass with cancrinite, etc). The locality is Fukushinzan, Korea.

MEXICO: Bright blue-green masses of turquoise occurs near Rosario, Sonora, Merico.

NORWAY: A considerable export business is expected to result from a recent proposal by the Research Institute of the Department of Defense of Norway, that mining be resumed at the old Fen Fields near Ulefoss in the district of Telemark, Norway, where mining of iron ore ceased several years ago. It was known that these fields contained deposits of "Sövitt", which contains niobium, apatite, and lime, but it is only recently that the deposits have been estimated a several million tons. Niobium, which is used extensively in the treatment of steel for jet engines, is becoming scarce as the only deposits of any importance now in the Western

World at Nigeria, West Africa, are said to be running low.

One ton of Sövitt yields about 4 lbs. of niobium, which is worth about $250 per pound. It also yields a substantial quantity of apatite concentrate, which is used in the manufacturer of phosphorus fertilizers. *Chemical & Engineering News,* June 12, 1950.

PANAMA: Burton E. Davis, Box 1459, Balboa, Canal Zone, recently sent R & M a number of minerals from Panama of which one assortment came from a hill known as Buccaneer's Hill located in northwestern Panama Province. The minerals consist of calcite (gray, coarse crystalline and coarsely crystallized) with with dark green chlorite; hematite (red earthy crust on cellular quartz); chalcedony (pale bluish-gray, botryoidal) with dark green moss agate.

Mr. Davis reported that "the specimens came from a hilltop about 7 miles east of Chiva Chiva, Canal Zone, but over the boundary in Panama. Some say the hill is named Buccaneer's Hill and was used by Morgan's men as a lookout, since you can see for miles in all directions."

SCOTLAND: Fine specimens of red stilbite crystals with red heulandite crystals occur in amygdules of basalt at Campsie, Stirlingshire, Scotland.

SWITZERLAND: While in Switzerland, the Farrs of Downers Grove, Ill., (see England) visited the famous Mt. Pilatus, in Unterwalden Canton. The mountain is near the city of Luzern (Lucerne) and is a famous tourist attraction whose top is reached by a cog railway. "It is a limestone mountain with big seams of white calcite," reports Mr. Farr. Nice cleavages of white calcite and gray compact masses of limestone containing veins of white calcite, were collected on the top of the mountain by Mr. Farr.

Two other collectors who visited Switzerland recently, are Capt. and Mrs. Howard P. Graf, of Peekskill, N. Y. Capt Graf, of the U. S. Army, is stationed in Germany (his wife and family are with him). A number of pebbles were collected from the Visp River, Visp, Valais Canton, Part of a letter received from Capt. Graf reads as follows:

"Pebbles collected from the Visp River. This river, flowing north with its headwaters at the Matterhorn, empties into the Rhone River at the city of Visp. It is a fast moving river, cloudy gray in color, no doubt from the shale it carries down with it. The pebbles were obtained as Eleanor and I sat on the bank waiting for a train to Zermatt for a view of the Matterhorn (a famous mountain in Switzerland)."

The pebbles received from the Grafs are: epidote (thin greenish veins in milky quartz); muscovite (minute white flakes in dark gray gneiss); paragonite (white, schistose); serpentine (dark green mass); and pegmatite (greenish and white, made up chiefly of epidote and quartz).

Dr. P. Staehelin, 64 Bernerring, Basel, Switzerland, also sent R & M a number of pebbles and a sand specimen, all from the Rhine River near his city. Writes he:

"I collected the sand about 6 km. upwards Basel City on the left bank of the Rhine (the right side of the river belongs to Germany) and the pebbles came from the same locality. The local name there is "Schweizerhall," as one collects for salt nearby (about the only drilling activity in Switzerland)."

Not all pebbles have been identified. Those that have are jasper (nice reddish-brown pebble) and nice milky quartz pebbles. The following rocks also included: conglomerate (reddish pebble); gneiss (dark gray pebble); limestone (dark gray pebble).

The sand is dark gray in color and consists chiefly of quartz (colorless, milky, etc); magnetite, muscovite, tiny broken sea shells, etc. Harry Grahl, 885 Cauldwell Ave., New York 56, N. Y., examined some of the sand and he reports: "Besides the quartz, magnetite, mica and shell fragments, it contains a few grains of garnet a few grains of brick, and I found a minute piece of lodestone with its coating of adhering magnetite grains."

UGANDA: John S. Albanese, P.O. Box 536, Newark, N. J., donated to R & M a brownish crystal mass of calcite which fluoresces and phosphoresces greenish under the Mineralight. The locality is Sukulu Hill, Tororo, Budama, Uganda, Africa.

URUGUAY: Fine grained emery occurs in the Department of Minas, Uruguay, but the deposit has never been mined.

Bausch & Lomb Named Tuf-Cote Distributor

(Here is an item of special interest to collectors who wear glasses. By applying tuf-cote to the lenses, it should protect them from pitting and scratching by fine particles flying off rocks being broken in the process of collecting minerals. Many a collector has had his glasses ruined by flying "rocks." — Editor)

Rochester, N. Y. — A preparation for coating safety lenses to make them more resistant to welding splatter and emery pitting is now available to purchasers of Bausch & Lomb ophthalmic lenses.

The preparation, known as Tuf-Cote, has been made available through an arrangement effected by Bausch & Lomb and the Wallace Optical Company, Inc., of Detroit.

Frederick J. Koeth, manager of Bausch & Lomb's Protective Eyewear Division, announces that lenses treated with Tuf-Cote will be supplied by all Bausch & Lomb sales and service divisions and affiliated offices.

Tuf-Cote's effectiveness is derived from its resilience, which cushions the impact of particles striking against lens surfaces and keeps them free from pits and scratches resulting from these and similar causes for a substantially longer period than is the case with untreated lenses.

The process involves the patented application of a crystal-clear solution. Both surfaces *may* be treated if desired. The coating, Koeth stated, produces no distortion, does not discolor or peel off, and permits the same degree of vision as is afforded by untreated lenses, thus preserving surface quality for much longer periods of time and contributing to economy and safety. Lenses can be recoated indefinitely so long as their surfaces are undamaged.

A prescription lens of any curvature, Koeth said—from plano lenses up to corrections of plus or minus 15 diopters, with the single exception of Ultex K, segment side—can be treated successfully. The process is applied largely to safety glasses but may be used in the coating of conventional dresswear lenses as well.

T. A. Patterson Featured In Granby Paper

ROCKS AND MINERALS is indebted to T. A. Patterson, RR 1, Granby, Mo., for a copy of the Centennial issue (1850-1950) of *Granby News Herald*. This is a 32-page illustrated edition full of interesting news and facts on Granby, the oldest lead and zinc mining town in the southwest. On page 28 is a picture of Mr. Patterson and this interesting item about him:

"T. A. Patterson — Twenty-five years a resident here. Mr. Patterson has made an exhaustive study of minerals in this and other areas of our country. He has written several articles about minerals and mineral formations that have been published in national magazines. He lists his businesses as Mineral Business and Fruit Grower. He is in charge of the mineral displays in the store window during the Centennial celebration.'

ROCKS AND MINERALS has printed many interesting items on the minerals of Granby that have been sent in by Mr. Patterson, a subscriber.

R & M Shows The Way!

Editor R & M:

My wife and I wish to thank ROCKS AND MINERALS for many happy and instructive hours of reading. It has shown us the way thru its maps and articles to many thrilling mineral locations all over the eastern section of this great country of ours. We have made many new and interesting friends among your subscribers who have each done their bit to help us learn the story of the rocks. Without the guidance of your magazine, much of this experience would have been lost to us.

Ervine D. Williams
September 3, 1950 New London, N .H.

Overheard In The Surgical Ward!

One-Arm Vet: "Who is that one-legged man sitting over there reading ROCKS AND MINERALS?"

Vet with bandages on his head: "I don't know his name but he always wears a flower in his lapel, smokes cigarettes all the time, and drinks that North Carolina white corn liquor. Has his pockets full of those little colored rock crystals."

One-Arm Vet: "Oh! he ain't nothing but one of them rockhounds."

(Item sent in by A. Sprunt Worthen, Co. 1, Veterans Hospital, Mountain Home, Tenn.)

COLLECTORS KINKS

Steve has built a wall cabinet with 8 glass shelves and 4 concealed lights, and our choice specimens are displayed there, arranged according to Dana's classification. The arrangement and printed labels are *my* job. Steve wants the cards all alike.

He cuts spools in half, lengthwise, saws a groove in each for the labels, and the cards stand up nicely near the minerals.

Mrs. Steve Blake
Kittery Point, Me.

WALTER D. ADAMS

COLLECTOR OF MINERALS

It was in the fall of the year, October 15, 1867, to be exact, when the maples were at their reddest, the chestnuts their brownest, and the evergreens their greenest, that a son, Walter Delos, was born to Henry and Sara Smith Adams at their home which Henry had built a few years before in Wilmington, Vermont. Right from the cradle this baby learned to love nature—the woods, the valley, the roaring river and the quiet water of the lakes. The years rolled on and the winters were hard. Bitter winds blew the snow into high, hard drifts, but the farm work still had to be done.

When they did catch up on the work, or there was so much snow that the work couldn't be done, Walter would trudge three or four miles to a little country school to learn all the teacher had to give. He learned quickly—had a wonderful memory for those things that interested him and did his best on those that didn't. He couldn't attend school very often because the work had to be done on the farm. By the time he was going to school, Walter could recognize the trees by their bark, leaves, or just by the shape alone. Ever since Walter had been able to toddle down to the stream that runs through the dooryard, and was so entranced by the beauty which he saw on the bottom, he was determined to know the reason one pebble was red while the next was blue. "Why, why is this so?" That was to be his motto throughout his life.

He had a younger brother, Leslie, who was a very great part of Walter's life. As he was not strong, he went to school regularly, went on to high school and commercial college. Even as town clerk living in the center, he spent his spare time with his elder brother on the farm with his wife, Ada Adams. The boys were much attached to each other, enjoyed and took pride in each other's accomplishments all through life.

As the years rolled by, Walter gained in his skill of carpentry, (his father was a maker of sap holders and gathering tubs) and other wood work as well as in stature and mind. His control of the hammer came in mighty handy as his mineral collection grew. He and his wife, Ada, stayed up late evenings, reading every book on geology that they could get their hands on, with Uncle Leslie's help. They were up many a night after midnight labelling and reading about precious gems—deciding which ones they had, where to get the ones that they didn't, how they were formed and all about them. At first, Walter kept his boyish collection in a drawer done up in handkerchiefs, but as he grew older his collection also grew. He made chests of drawers for it and kept them in his room. The collection was overflowing. He then filled the room which has always been known to me as the "museum." Showcases were placed in other rooms as well as in the museum. Friends from far and wide, sent and brought bits of rocks, minerals, gems, anything they could pick up. He was known to mineral collectors from far off. All classes of people came to view this collection that was started by wondering what made one pebble blue while the next one is red—by picking them up and saving them—by "picking up pretty stones from the brook that runs through the dooryard" as Walter once replied when asked what first interested him in mineralogy.

Walter was a very lovable man. I never heard him say a cross or bad word to anyone or about anyone and that is something I can't say about very many people. He loved children and all people no matter what their race, religion or creed. He was a man who admired you for what you are and not who you are. He worked for the good of the other fellow and not for himself.

He had a shock in 1944, which paralyzed his left side. He recovered partly, but was never able to do much after that. He died December 26, 1947, in Brattleboro, Vermont. The last time I saw him,

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COLLECTORS' COLUMN

Conducted by A. CAL LECTOR

This column, which began with the Sept.-Oct., 1948, issue, is of special interest to beginners in mineralogy as we comment briefly on one or more of the common minerals. In the last issue we talked on chalcopyrite, the chief ore of copper. This time we will take up chromite, the chief ore of chromium.

Chromite

Chromite, an oxide of chromium and iron, is the chief ore of chromium. It is a heavy, black, metallic mineral which received its name from its chromium content.

Chromite is found commonly in a massive form, often granular. Crystals are known but they are uncommon and when found are chiefly tiny octahedrons.

The mineral is found in many countries but the chief chromite-producing countries are Cuba, Greece, India, New Caledonia, Philippines, So. Rhodesia, Transvaal, Turkey, U.S.S.R., and Yugoslavia.

There are a number of localities for chromite in the United States but those in Maryland and Pennsylvania may be considered the most important, even though all the mines have been abandoned for many years. In Maryland, the numerous shafts and pits in the Bare Hills section of Baltimore County are historic because it was here that the first commercial deposits of chrome ore in the world was worked by the Tysons over 100 years ago; the Reed chrome mine, 2 miles northwest of Coopstown, Harford Co., is considered to have been one of the largest chrome workings in the state. The State Line chrome pits (Low's Mine) ¾ mile north of Rock Springs, Cecil Co., Md. (on the Maryland-Pennsylvania line) was a famous producer of chromite where good specimens may still be found.

The most famous chromite mine in the United States, if not in the world, is the Wood's mine, near Texas, Lancaster Co., Penn., which in its days was the largest chromite mine in the world. The Wood's mine not only furnished fine cabinet specimens of chromite but a large number of other interesting minerals of which williamsite, a greenish nickel-bearing serpentine, was first found here and named after the owner of the mine, L. W. Williams.

At Hoboken, N. J., and on Staten Island, N. Y., chromite is common as minute black grains in the greenish serpentine which outcrops there.

California, Montana, North Carolina, Oregon, Wyoming, and Canada, have important chromite deposits where good specimens may be obtained.

Chromite was first discovered over 125 years ago by Pontier, who found the mineral near Gassin, Department Var, France, as masses disseminated in serpentine.

If your collection is lacking in chromite, then you should order one, two, or more specimens—each from a different locality. Your favorite dealer can supply them—you order—he will supply.

Magazine Is A Dandy!

Editor R & M:

You are a busy man but I should like to thank you for the little item under "World News on Mineral Occurrences" which has brought me in contact with several collectors who have already mailed in some most unusual specimens and even one or two young women have asked for samples. This was a surprise—a most welcome one—to me.

ROCKS AND MINERALS grows better in each issue and I only regret that I did not join up years ago, however, I was a very busy man and had to confine my activities to my professional work but had an hour now and then in which to love minerals. I began to love minerals back in Orange County, New York, in about 1880—I fear I'm worse now than at that distant date.

The article "Minerals in our World" by Mr. Rowley is a gem and I say that because I've always had to explain in a primary way so much to those who do not have the technical training in geology.

Anything on the structure under New York City is of interest to me as I did much work at one time in the way of deep drilling.

The magazine as a whole is a dandy.

Albert L. Fritz
Miami, Arizona

July 3, 1950

THE MICRO-MOUNTER

Conducted by LEO N. YEDLIN, 633 W. Penn St., Long Beach, N. Y.

The beauty and brilliance of m/ms are things that cannot be described adequately. They must be seen. And transporting equipment to display the wonders to a large group is not without difficulty. And so the obvious answer is color photography.

However, problems exist which have not as yet been overcome satisfactorily. Primarily, there is the matter of stereoscopic effect on a plane surface—the screen. We use a stereo-binocular microscope for viewing the m/m, for this instrument gives by far the best results. A three-dimensional picture is presented, and this, more than any other factor, is responsible, for the magnificence of the viewed mineral. (We use superlatives advisedly.)

In photographing m/ms a monocular 'scope is used, with a wide field and long focus objective. Still, the results, while top-notch, are not quite perfect. It has been suggested that a stereo camera be hooked to the binocular microscope. This is fine for observation thru a stereo viewer. But the double image cannot be projected to give adequate results without the use of special equipment, both for projection and viewing.

However, photography thru a monocular instrument is still a superior thing. A great many people are not fully aware of the techniques. Perhaps a letter from one of our readers, Alfred M. Perkins, of Las Cruces, New Mexico, and our answer to him, will clarify a great deal of haziness regarding the process. For further details the reference in our answer will help experimenters in this phase of the hobby. We're just beginning to try it out ourselves.

Mr. Perkins writes:

"I have been a regular reader of your The Micro-Mounter in ROCKS AND MINERALS for some time, but, although I much enjoyed reading your articles, it was more because of your very apparent sense of humor plus your very evident interest in your branch of our hobby than it was because of any interest on my part in micro-mounts. In fact, I wasn't interested in micro-mounts because I have no microscope and see little likelihood of acquiring one. But you can perhaps guess what has happened—friend wife presented me with a penscope not long ago and it has opened up a new world. Little did I realize what fairylands exist in vugs! And I was pleased and relieved to discover that the pencil type microscope—according to your May-June item—isn't too heavily frowned upon as a beginner's equipment.

"I am an inventor, not officially, but in the sense that I have invented many things only to discover that someone else had already had the same idea. So all I claim in any of my inventions is that I "thunk them up by myself." And that is probably what will happen to the present brain-child.

"For some years I have been using a color camera, and for a time I used a copying lens to get full-field pictures of flowers and other small, colorful objects. Now I want to photograph micro-mount material in color and achieve a semi-microscope effect by projection onto a screen. I have projected slabbed translucent agate, etc., and even tried projecting a plate of olivine grains, but the latter was a great disappointment in that the grains—in order to get them into the projector, have to be so small that they lose all of their color, so the only solution to that problem seems to be to photograph them in the usual manner and project the photograph. Now of course this isn't anything new, but I've never heard of anyone doing it except by using a copying lens and by using a hand-size specimen, which is o.k. so far as it goes. It would seem to me that if anyone had tried getting down to smaller subjects (i.e., micromount material) and using a microscopic lens, you would have heard

of it or perhaps you have tried it yourself.

"Applying such a lens to a camera perhaps presents some difficulties besides the perhaps unavoidable difficulties of limited depth and size of field etc. At least I have never seen a microscope lens advertised—at least not for use of "casual" photographers. I have written to the Eastman Kodak Co., for information as to the availability of such a lens or lenses, but in the meantime I am wondering what information you may be able to supply. Seems as if, with all the types of lenses that are available for various uses, some sort of a combination ought to be workable for my proposed use. What do you think?"

Our reply follows:

"The problem of photomicrography has been taken up pretty thoroughly, and where it relates to minerals in micro size its been covered by Jay Fox, in ROCKS AND MINERALS, June, 1941. I think Zodac still has some copies.

"At all events, you were mixing up the cart and the horse. For this type work you don't put a special lens on the camera. What you do is use the camera (with its lens removed) instead of your eye at the top of the microscope. Special tubular adapters are made, (and most photo shops stock them) permitting a set-up which is lightproof. I've just gotten some equipment to do this. My camera is the Kine Exacta, which is a single lens reflex job, ideal for the purpose. I don't use the binocular 'scope, but have a standard monocular instrument, with a 1x objective lens and 10x ocular. The enlargement is controlled by the length of the tubular adapters.

"Get that issue of R & M however. It really shows all. It is somewhat more elaborate as to equipment than you really need, but the fundamental stuff is well done.

"The penscope is a good little instrument. However, you won't be able to do photography with it. You can pick up a used monocular job rather cheaply. Make sure you get a very low powered objective, with a 2 or 3 inch focal length. Else you'll get no depth of focus."

One thing we do assiduously is follow the advertisements in ROCKS AND MINERALS. Rarely are there offerings for the micro-mounter alone, but a judicious "casing" of the written material sometimes turns up a "sleeper." This was the case in the last issue. The Bradleys, of Los Angeles, California, put on the market clear quartz xls with enclosed scheelite. We sent for some, and they turned out to be figurative gold mines. The crystals of quartz all had phantoms, and on the surface of the ghosts were implanted beautiful yellow clear octahedrons of the scheelite. In some cases the phantom wasn't even noticed, except that the octahedrons outlined the hidden crystal. And putting the specimens under fluorescent light disclosed a fine blue color.

Two of the crystals had something additional. Bright orange-red minute xls of hubnerite. These were finds, for getting hubnerite with sharp terminations is a rarity.

And for those of you who go for borates and associated material in m/m size, the Bradleys offer both northupite and tychite in loose crystals. These, mounted on the head of a pin, make wonderful specimens.

We've had many inquiries regarding the mounting of tiny loose xls. Try this technique. Spill some cement on a piece of cardboard. Hold the specimen to be mounted in a small tweezer. Dip the head of a pin in the cement and bring the pin and mount together under the microscope. Cement a cork to the bottom of the m/m box. Stick the pin into the cork until the specimen is a quarter-inch below the top edge of the box. The pin will project thru the bottom of the box. Cut the pin off as close to the bottom of the box as possible. About an eighth of an inch will still project. Push this back until the cut edge of the pin is flush with the bottom of the box. The m/m specimen will then be the correct distance

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GOLD PANNING

By ROBERT ROOTS
3147 W. 39th St., Denver 11, Colo.

Since I was lucky enough to win the National Mineral Society Gold Panning Contest at the Sacramento, California Convention last year, I have been asked many times how to pan gold. In this article I will try to answer some of the questions that I have been asked.

About 1930 work was scarce and having the time I joined what Courtney Riley Cooper called the 50c gold rush. At any rate I had lots of company as they figured there were 50,000 people on the creeks of California alone. I first went with a companion to Nevadaville above Central City, Colorado. After three weeks work we had a ball of badly retorted amalgam that we turned into the mint. When the return came back we had a check for a little over $25.00. It seems the gold up there only went 602¼ fine. That winter I spent on the Fresno River above Madera, California, with my uncle and cousin. We panned beautiful gold, a pale yellow and a little over 700 fine. In the spring I went to visit my mother in Los Angeles. At Fresno I met a friend who told me to go to Deer Creek near Grass Valley, California. I spent the next three summers there. As winter set in, I would go to the gold digging around Ogilby, California, and Yuma, Arizona. I never had a lot of gold but I had the best time of my life. A little note here might say that 50c went a lot further then than it does now. In these places I met people who knew many ways of panning and saving gold and I tried to learn the best way to do it for myself.

Gold Pan is a Prospecting Tool

First the gold pan is a prospecting tool and very rarely used in mining except as an aid to cleaning the sluice box or other gold catching device. It is used to prospect gravel bars, stream beds, etc. to find the richest place to put other gold catching devices to work. In itself it is a very poor tool to use in real mining. Its capacity is small, 600 lbs. of gravel in a day would be a big day's work. In prospecting, the gravel is seldom panned down to the gold but just far enough that we can get all the gold in a tail at one side of the pan. The best panner I ever met was Pete Thompson; he had a trick of getting a tail while the pan was still half full of gravel. This meant that he could try more places than we could.

The gold pan can be used wet or dry. Gold itself can be cleaned better dry. I will explain this later. In panning I like a 16 inch light sheet iron pan. The grooves sometimes pressed into the side of the new pans are of no help and were never seen in the old time pan. A small 12 inch pan is sometimes used. The Mexican pan is nothing but a shallow bowl called a batea. I have seen a Mexican use one of these dry. As he saw a piece of gold he would put it under his thumb. He ended up with an empty pan and five small pieces of gold, about 5c, under his thumb.

How to Use The Gold Pan

The pan is filled with a shovel full of gravel and placed in the water. The pan is given a circular back and forth motion until the water has had a chance to fill it; then set the pan down and by raking the rocks over with your fingers work them to the top and remove them, watching at the same time to see if by chance there is a gold bearing rock. This raking permits the heavy gold to work toward the bottom. The raking is done sometimes with one hand washing each rock carefully before removing. Then give the pan a circular back and forth motion until the whole mass is free and moving. Then tip up the back of the pan and work the remaining mass to the lower edge of the pan. By raising and lowering the water, a wave will come and wash away the light top material and if at the same time a slight side motion is given the pan the wave will come in at one side and then the other. After doing this a number of times the pan is again given a circular back and forth motion and the mass reset on the lower edge. After this has been done several times most of what

is left will be black iron and gold. On the Fresno River this will be complicated by the presence of zircon, also a heavy mineral. In actual mining this is as far as you need to go. Now by letting the mass work to the lower edge of the pan we are ready to see what we have. With just a little water in the pan start running it back and forth in waves, working it along the lower edge of the pan in one direction. This will gradually work off the black iron and the gold being heavier will lag behind, forming what we call a tail. A tap on the edge of the pan will sometimes help to settle the gold. In contest panning this must be panned down almost to the bare gold as this will count I believe for many of your points. After taking many pans you will be able to estimate just how much it is worth and if you want to take a chance and work the ground. The panning is generally thrown away unless it is very good.

Desert Panning

On the desert where panning is done with very little water, it is quite different. Almost all gold saving is done with a dry washer using air to float off the lighter parts. The day's concentrates are placed in a pan, a little water is added and the mass is worked to the lower edge of the pan in the same manner as in wet washing. Then reverse the pan placing the mass on the high part of the pan and the water in the lower part of the pan. The water is worked in circular wave motions reaching up to the lighter parts of the mass and washing them to the bottom of the pan where it is raked out with the hand letting it drain a little on the way out so as not to lose the water. After part of the mass has been removed and the gold begins to show, the mass is resettled and the operation repeated. Toward the last the gold is pushed back with a finger. In this way a whole day's cleaning from a dry washer can be washed with a quart of water. In fact I washed without soap in the morning and this is the water I used. When the residue is quite small, drain off the water and place in the sun for a minute until dry. Pick out the larger pieces. Loosen the residue with a finger and settle it on the lower edge, it is now cleaned with the breath. Blow gently on the edge, this will remove the iron, resettle and blow again until the gold is clean. In the old days they had what is called a blowing horn but I have never seen one used. The iron is pushed over the rim with the finger. With care there is very little loss of gold as it is bright and can be seen against the pan and resettled. This is not as hard as it sounds and a little practice makes it easy.

Dry Panning

Another way of panning is called dry panning. This is used on the desert where water is scarce. This is similar to wet panning except that no water is used. The gold is worked to the bottom by the same circular back and forth motion. The rocks removed and then working the mass to the lower edge of the pan and blowing on the surface the sand is removed to the bare part of the pan and pushed over the rim. After several blows resettle the mass and repeating the blowing, gradually the rough will be removed and then the residue is cleaned in the same manner as in cleaning gold. Gold shows up very plain on the bottom of the pan and can be pushed back if needed.

A Few Hints on Panning

Fine gold must be kept wet or it will float on top of the water. I have been informed that muddy water will carry gold up to 40 mesh. If you touch gold in panning be sure to wash or dip the finger in the water or rub if dry panning. When the gold is in mud, the mud must be broken up with the fingers. If balls of mud are allowed to work out of the pan they will take the gold with them. If you wish to pick up a small piece or flake of gold, it can be picked up on the end of a match wet in the mouth. By lowering into a vial part filled with water, it will fall off the stick. This is a must. A pan may be rusty and a scouring with sand will clean it. But a greasy pan will not save gold. Do not use the gold pan for a wash basin or dishpan as

it will take a lot of scouring or burning to clean it for panning gold.

Some Names for Placer Gold

Various names have been used for types of gold. Most of them describe themselves. Nuggets, wheat, scales, flakes, fine gold, fine heavy gold (the particles are solid, not flat), paint or microscopic, the last two are so small that they sometimes cannot be seen with the eye until made into a tail, quartz gold with small pieces of quartz sticking to the gold. No doubt many other names are used in other places.

Fineness of Gold

Fineness of gold is in number of parts of gold to the 1,000. The greatest impurity is silver. As a rule the lighter the color the more silver. Copper is sometimes present. Placer gold is generally finer then mined gold. The finest gold I know of comes from near Elizabeth, Colorado, where I saw a mint return of 992¼ fineness. Most of the placer gold I have seen would be between 725 to 875 fineness. Another thing that makes a collection of placer gold interesting is that I have never found two specimens from different places to be the same color.

FATHER OF AMERICAN GEOLOGY

By Peter Zodac

Some few weeks ago our local radio station (in Peekskill, N. Y.) had a quiz contest which ran for many days before the correct answer was obtained. The question, "Who is the Father of American Geology?" drew more blanks or incorrect answers than perhaps any other question ever asked by the radio station.

The correct answer is William Maclure.

In the event that this question may be of some interest to our readers, the following biography on Maclure is taken from an old encyclopedia.

Maclure, William, b. in Ayr, Scotland, in 1763 visited New York in 1782; settled in London soon after as partner in a commercial house; gained a considerable fortune; emigrated to the U. S. in 1796; was one of the commissioners on the French spoliation claims in 1803; became interested about this time in geology, which he studied in Europe, and conceived the plan of making a geological survey of the U. S., in which undertaking he crossed the Alleghanies fifty times and visited nearly every State of the Union, traveling chiefly on foot. He presented geological memoirs to the American Philosophical Society in 1809 and 1817, the latter accompanied by the first geological map of the U. S., thereby gaining the title of "father of American geology." Settling in Philadelphia, he gave his books and collections to the Academy of Natural Sciences of that city, of which institution he was president from 1817 until his death. He resided in Spain 1819-24; engaged in an unsuccessful attempt to establish a college on an agricultural basis; made an attempt of the same kind at New Harmony, Ind., where he bought a large tract of land and resided several years; went to Mexico for his health in 1827, returned there in 1828, and resided there until his death, which occurred in San Angel, near the city of Mexico, March 23, 1840. He left $20,000 to the Academy of Natural Sciences, besides his library as already mentioned, and was a liberal benefactor of the American Geological Society, of which he was president in 1828. While in Mexico, he wrote a work entitled *Opinions on Various Subjects* (2 vols., New Harmony, 1837).

Johnson's Universal Cyclopedia

A. J. Johnson & Co., New York

Vol. V,p. 154, 1888

AMERICAN GEM AND MINERAL SUPPLIERS ASSOCIATION

In response to popular demand as expressed at the recent convention of the American Federation of Mineralogical Societies at Milwaukee, the formation of the American Gem and Mineral Suppliers Association is announced by Thomas S. Warren, President. Enthusiastically approved by the dealers in attendance, over 90% are now members and have endorsed the principles and program of the organization.

Based on the code of ethics for industries of this type as established by the Federal Trade Commission, the aim of the association is to organize all better-class mineral dealers into a group that will subscribe to and support these fair-practice regulations. In this way the association will help its member-dealers to get better acquainted and promote greater cooperation, as well as helping to assure all purchasers of a fair deal when they buy from association members.

A triangular symbol has been adopted and a membership plaque has been designed to be supplied to each member in good standing for display in his place of business. General advertising in suitable magazines is planned so that both individuals who buy by mail and others who travel over the country can learn to depend on dealers who display it for honest and fair service.

The association recognizes its obligation to mineral societies all over the country. One of the first actions of President Warren and Executive Secretary, Fred Bitner, was to offer its assistance to the American Federation of Mineralogical Societies, the various regional Federations, and mineral and lapidary societies, in putting on the mineral shows which are usually held each year. This would include taking over the commercial space and guaranteeing the Federation certain other advantages.

Heretofore there has been no operating organization to assume such a responsibility. But the new association will undertake the job at conventions where it is invited to do so, with the understanding that if results are not entirely satisfactory the responsibility will again revert to the local Federation involved. This would release the Federations from a great deal of work necessary in promoting conventions and permit them to spend more time on publicity. It would also provide greater publicity for the various convention meetings, and should result in greater attendance and greater interest in the hobby of mineral collection.

Both the Association of Mineral Suppliers and the Federations of Mineralogical Societies have the same object, and that is to increase the number of people interested in the collection and enjoyment of minerals. Through mutual cooperation a greater amount of information can be spread concerning the pleasures to be derived from this fast-growing hobby.

Any Federations or Societies interested in taking advantage of this cooperation, and dealers interested in membership in the association, are invited to write for full information to Mr. Fred Bitner, Executive Secretary, American Gem and Mineral Suppliers Association, Scottsdale, Arizona.

Noted Spectrographer Joins Staff of United States Testing Company, Inc.

The United States Testing Company, Inc., announced July 5, 1950, that Mr. O. Ivan Lee has joined the staff of the Company's main laboratories in the capacity of Chief Spectrographer.

For over thirty-five years, Mr. Lee has been prominently connected with many developments in the fields of organic and inorganic chemistry. He is author of numerous technical papers, and is widely known as an expert Spectrographer and Mineralogist.

The Company has supplied Mr. Lee with the finest spectrographer equipment, including a Baird Associates Spectrograph, a Jarrell-Ash Comparator, and a Beckman Photoelectric Spectrophotometer.

The Spectrographic Laboratory serves many branches of industry and is particularly useful to manufacturers of chemicals, metals, pharmaceuticals, textiles, plastics, as well as to the medical profession.

H. M. Block, Vice-Presi-
Main Laboratories
1415 Park Avenue
Hoboken, New Jersey

OPPORTUNITIES FOR LECTURING AND RESEARCH ABROAD UNDER THE FULBRIGHT PROGRAM FOR THE ACADEMIC YEAR 1951-52

GEOGRAPHY AND GEOLOGY

(The Closing Date for Submitting Applications is October 15, 1950)

1. Approximately 300 awards for United States citizens to serve as visiting lecturers or to engage in research in institutions of higher learning abroad during the academic year 1951-52 have been announced by the Department of State under the provisions of Public Law 584 (79th Congress), the Fulbright Act.

Many of the awards are open to applicants in the fields of geography and geology. Countries now participating in the program are Australia, Belgium-Luxembourg, (including the Belgian Congo), Burma, Egypt, France, Greece, India, Iran, Italy, Netherlands, New Zealand, Norway, the Philippines, Turkey, and the United Kingdom, including the British Colonial Dependencies.

2. In addition to the large number of awards offered without specification of subject or sponsoring institution, attention is called to the following specific opportunities in geography and geology and related fields at certain designated institutions abroad.

Burma

Geology: Burma offers unusual opportunities for research in geology because of its wealth of mineral resources and its interesting structural features. The visiting scholar in geology would be attached to the University of Rangoon, which is especially interested in sponsoring a specialist in stratigraphy, paleontology, or economic geology. Applicants should note that the academic year begins in Burma in late June and ends in March. The successful candidate should also be prepared to give invitational lectures in his field of specialization.

Egypt

Paleontology: Farouk I University in Alexandria has expressed an interest in receiving a visiting lecturer in this subject. Additional details regarding this opportunity are expected in the near future.

Netherlands

Geology: Although no particular aspect of the subject is given preference, geology is among the subjects in which a visiting lecturer would be welcomed at the University of Utrecht.

Norway

Geography, Geology, Mineralogy: The University of Oslo has included these subjects among those in which it offers the greatest opportunities to American research scholars.

New Zealand

Offshore Sedimentation: The Museums Association of New Zealand has proposed that an American scholar participate in an investigation into the origin and distribution of the sediments at present forming on the continental shelf around New Zealand. In addition to its general geologic importance, this project has significance for determination of the horizon and extent of coal deposits and also of limestone, which is important in the cement industry.

Oceanography: The Museums Association of New Zealand is also interested in sponsoring research in oceanography as a part of the Pacific-wide program of oceanographic research recommended by the seventh Pacific Science Congress. Although a specialist in marine biology or an experienced director of oceanographic research would find more of interest in the way of current research in New Zealand, the opportunity is also open to a specialist in the physio-chemical meteorological or physiographic aspects of oceanography.

Geophysics: The Department of Scientific and Industrial Research offers an opportunity to an American geophysicist with a background in engineering to collaborate with a team of New Zealand scientists on investigations of the Rotorua Thermal Area. The geophysical section will carry out gravimetric, electrical, air-

borne magnetometer and seismic surveys, and investigations into drilling and thermal conductivity and specific heat of rocks.

(Note: As the number of awards available for research in New Zealand is limited to three and as these are open to applicants in other fields as well as to applicants in geology, it should be kept in mind that an award may not be made in connection with each of the projetcts listed above, although all applications will be carefully considered. It should also be noted that the academic year in New Zealand begins in March and ends in December.)

Philippines

Economic Geography: Although not on its priority list, economic geography has been included by the University of Philippines in the list of alternative subjects in which a visiting lecturer from the United States is desired. The academic year in the Philippines begins in late June and ends in March.

United Kingdom

Most of the awards available for lecturing and research in the United Kingdom are offered without specification of subject or receiving institution. The following universities or university colleges, however, have indicated an interest in receiving American lecturers or research scholars in geography: Aberdeen, Bristol, Cambridge, Edinburgh, Liverpool, London, Nottingham, St. Andrew, Sheffield, Hull, Leicester, Southampton, the University College of Ibadan in Nigeria, Raffles College in Singapore and Makarere College, Uganda, East Africa. An interest in specialists in geology has been expressed by the Universities or University Colleges of Aberdeen, Birmingham, Bristol, Cambridge, Liverpool, London, Manchester, Nottingham and Southampton. Since it is desirable that American grantees be distributed widely throughout the British university system, applications made with a view to attachment at universities other than Cambridge, London and Oxford are especially encouraged.

Other Countries

Programs for Australia and Turkey will be announced by the Department of State in the near future. It is anticipated that opportunities will be provided for research in Australia in economic geography (human settlement types) and in geology (invertebrate paleontology). Opportunities for lecturing in physical or human geography are anticipated in Turkey.

Most of the countries participating in the Fulbright program—especially France, Italy and the United Kingdom—provide a number of awards which are not restricted as to subject or receiving institutions. University teachers or post-doctoral scholars in the fields of geography and geology should not hesitate to apply for undesignated awards, especially for research in countries in which they are interested.

3. The awards are made under Public Law 584 (79th Congress), the Fulbright Act, which authorizes the Department of State to use certain currencies and credits acquired through the sale of surplus property abroad for programs of educational exchange with other nations. Awards are ordinarily made for one academic year, although in exceptional cases applications will be considered for periods of not less than six months. Grants for teaching or research usually include round-trip transportation for the grantee, a maintenance stipend, including certain allowances for dependents, and a small supplemental allowance for travel and equipment purchasable abroad, if necessary. The grants are made in the currency of the country to which the grantee is going and are not convertible into dollars.

4. No award will be made for teaching or research in more than one country in any one year and only one application may be filed each year. Applicants may indicate an alternate country, however, if the proposed activity can be satisfactorily completed in more than one country. In case he cannot be accommodated in the program of the country of his first choice, he may be considered for the alternate country named.

5. The closing date for filing applications for awards for lecturing and research for the academic year 1951-52 is October

(*Continued on Page* 523)

CLUB AND SOCIETY NOTES

Attention Secretaries—If you want your reports to appear in the Nov.-Dec. issue, they must reach us by October 15th—the Editor.

The Cincinnati Mineral Society

The regular meeting of the Cincinnati Mineral Society was held 8:00 P. M., May 31, 1950, at the Cincinnati Museum of Natural History. In the absence of our president, Mr. James Clements, the meeting was presided over by our vice-president, Mr. Thomas Wiebell.

At this meeting Mr. Waldo Younker was accepted as a member of this Society.

Our member speaker for the evening, Mrs. James Fox, was introduced by Program Chairman Mr. Grover Hubing. Mrs. Fox, a charming, vivacious and talented speaker, chose as her subject the ever fascinating mineral Garnet. Her capable and thorough covering of the subject enriched the background of those present.

For the benefit of those not present, here briefly is a summary of the material covered.

"Garnet"—The name refers to a series of closely related minerals. Several chemically similar elements replace one another in the group. The properties are variable and they grade into one another. All varieties crystallize in the isometric system with similar forms. The rhombic dodecahedron so common and characteristic that it is sometimes called "Garnetohedron."

Usually occurs in well crystallized, granular aggregates, rounded and disseminated glassy grains. Imperfect rhombic cleavage and a conchoidal to uneven fracture. Hardness varies 6.5 to 7.5, specific gravity 3.4 to 4.3 depending on composition. Color ranges thru everything but blue. Garnets are isotropic, show no dichroism, the two images viewed in the dichroscope are identical, this diagnostic feature distinguishes it from ruby.

Chief uses of garnet are as an inexpensive gem stone, abrasive in industry, minor uses as bearings in instruments. Varieties discussed included grossularite-lime aluminum garnet with gem names: cinnamon stone, hessonite, and essonite. Grossularite has a peculiar granular structure easily seen with a hand glass in cut stones.

Pyrope—beautiful ruby-red garnet would be colorless if pure, color due to impurities. Name from Greek meaning "firelike." It is a magnesium aluminum garnet occurring chiefly in basic igneous rocks such as peridotite and serpentine.

Spessartite is the manganese aluminum garnet, ferrous iron sometimes replaces the manganese and ferric iron the aluminum, rarely used for gems due to unpopular brown color.

Almandite garnet having a hardness of seven plus and being plentiful make it most desirable as an abrasive. Only minor use is as a gem.

Rhodolite which is two parts pyrope and one part almandite, gets its name from the delicate pale rose to violet color of the North Carolina rhododendrons where it is found.

Uvarovite is the uncommon emerald green variety whose color is due to the presence of chromium, it is the only infusible garnet. Andradite, topazolite, demantoid and melanite garnet are others that were covered in the talk.

June Meeting

The regular meeting of the Cincinnati Mineral Society was held at 8:00 P. M. Wednesday June 28, 1950, at the Cincinnati Museum of Natural History.

The meeting was presided over by our president, Mr. James Clements, and was attended by ten members and 5 guests.

Our guests, Mr. Dudley Levick, Mr. Carl Wiegand, Mr. Earl Alford and Mr. and Mrs. Russell Soveriegn, have been with us for a number of meetings and it is hoped they will continue with us as members.

As announced this meeting was to be a mineral auction with specimens presented by the members. Despite the relatively small turnout, the contributions of specimens was quite generous. The purpose of this auction was primarily to aid members to purchase good specimens at a cost far below current dealer prices, and of course if our treasury benefitted so much the better.

Mr. Grover Hubing, Program Chairman, got things under way by appointing Mr. C. L. Gschwind as official auctioneer much to Mr. Gschwind's surprise.

The auction was conducted in true tobacco auctioneer style with the bidding strong, and all the tricks of acknowledging bids such as nodding, winking, rubbing nose, etc., were employed by bidders.

The material auctioned covered a good range of high class material. Outstanding being three bort diamonds showing octahedral crystal form, presented by Mr. Clements. Incidentally one of these was promptly lost after purchase and a diamond hunt ensued, at this writing it still had not been found. Other outstanding pieces were the beautiful native copper specimens courtesy of Ralph Clark, beautiful Rosiclare and Mundy's Landing fluorite by Mr. Gschwind and a number of rare minerals courtesy of Mr. Sarles. The auction was declared a success by everyone including our treasurer, Ralph Clark, who announced we were richer by $22.61. We plan to try this again in the fall when a larger attendance can be expected.

Charles L. Gschwind, Sec.
6931 Diana Drive
Cincinnati 24, Ohio

Annual Report of The Central Iowa Mineral Society — June 2, 1950

The Central Iowa Mineral Society with an adult membership of fifty has held ten monthly meetings during the year with an average attendance of thirty members.

While the first two meetings of the year were confined to vacation experiences, travel pictures and convention reports, the remaining ones were especially helpful in getting a better understanding of minerals as well as acquiring skill in mineral identification. These programs included a study of mineral chemistry, of geodes, quartz minerals, petrified wood, lead smelting and refining and the aluminum family of minerals.

"Getting Acquainted with Minerals" by George English, was used as a study guide in our programs.

Two other informative programs included Professor Yoder's talk on "The Use of United States Geological Survey Maps" together with a demonstration of the Geiger Counter by Dr. and Mrs. Smythe.

Field trips included those held in connection with the Midwest Convention at Davenport, Iowa, a trip to the Keokuk area for geodes. to Redfield for arrowheads and to Madrid to see the mineral collection of Mr. John Spence.

Following our field trip to Redfield our president, Mr. Straight, invited us to his home where we enjoyed a picnic supper and had an opportunity to see his outstanding mineral collection.

In January we were again guests at the home of Mr. and Mrs. Straight. A delicious oyster supper was served. Forty-five members enjoyed the gracious hospitality of our president and Mrs. Straight.

During the National Convention of the American Federation of Mineralogical Societies held in Sacramento, Calif., June, 1949, special recognition was given to two of our members —to Mr. Straight for his unusually fine copper and iron exhibit and to Dr. Beane for his crinoid collection.

Awards were given to John Sanders and Jim Hunnicutt for their outstanding mineral collections at the Midwest Convention held at Davenport, Iowa, August 26 to 28.

We are especially indebted to John Sanders and his father for their work in preparing and exhibiting their mineral collection for the Better Home Exposition, the Scout Exposition, Younker's Tea Room, and the Science Fair held at Lincoln High School.

..A variety of fine mineral specimens contributed by Mr. Straight, Mr. Sadilek, Mrs. Hays, Mr. Crosman, and others have been given to members either as prizes or as specimens for their mineral collections.

Membership cards, designed by Mr. Sadilek, were issued for the first time at our May meeting.

Mr. Straight appointed Mrs. Hafenstein to design a letter head for our official stationery.

A report of special significance was read at the March meeting which was the fifth anniversary of our Society. This report, describing the early organization of our Society, was prepared by the late C. W. Yaggy, chairman pro tem, Mrs. Richard G. Hayes, secretary; and Dr. Arnold Smythe, treasurer.

On Sunday, July 16th, the Society held its summer picnic at the Ledges State Park. Dr. C. J. Ray of Iowa State College, who was our guest speaker, told of the interesting sandstone formations in this area. We were also delighted to have with us on this occasion Mr. Ben Hur Wilson, of Joliet, Ill., who was a special guest of our president, Mr. H. R. Straight.

Irene M. Smith, Sec.
1108 26th Street
Des Moines, Iowa

Pomona Valley Mineral Club

The Pomona Valley Mineral Club members learned many of the secrets of mining tin as it is done in Cornwall, England, from an experienced tin miner, Mr. Kilian Bensusan, who talked at their June meeting. Mr. Bensusan was assisted by his wife who showed many fascinating pictures illustrating how the tin mines, extending many thousands of feet out under the sea, were worked. Mr. Bensusan graphically demonstrated the method used in earlier times by which miners descended to the lower levels of the mine. They rode the tiny platforms just big enough for two feet and a sack of ore, which were fastened to long shafts that were raised and lowered in spurts by huge moveable beams.

The July meeting of the club consisted of an escorted tour of part of the San Andreas earthquake fault line extending from Cajon Pass to the Big Pines region. Mr. George Bellamin, instructor at Los Angeles City College, led the tour and provided detailed maps of the fault lines in this region. Members were shown just how this longest mapped fault line in the world could be traced by means of telltale signs. He explained the difference between a single fault line and a rift zone where many faults and fractures have occurred. The tour ended in a picnic lunch at Big Pines Park and afterwards the group collected actinolite from the Wrightwood location where it is found in great quantities.

The August meeting was a pot-luck dinner held in San Dimas Park where members exchanged both food and mineral specimens.

The Pomona Valley Mineral Club is sponsoring an extensive mineral exhibit at the Los Angeles County Fair the last two weeks in September, in which many mineral clubs of southern California are joining. A fine display of superb specimens is expected to be on view.

Alice Cohoon, Treas.
246 W. Aliso Street
Pomona, Calif.

Pacific Mineral Society

The Pacific Mineral Society meeting for June was held the 23rd with a good turnout of members and friends to hear the annual talk by Victor Arciniega explaining about "Identification of Gem Stones as Minerals." Mr. Arciniega was our first president and always gives an interesting talk as the summer vacations start and he can get away from his classes at Manual Arts High School.

Of course the first question of the evening was "Did we bring home the plaque?" At the time of the meeting we had not received word as to the decision; it seemed to be debateable between the eight foot case displayed by Pasadena or the standard six foot size by the Pacific Mineral Society.

One estimate of the number of visitors in Trona for the Federation meeting was about a thousand with about thirty of them being members of our Society. The weather was exceptionally good for summertime in that area, being comfortable Friday and a little warm Saturday afternoon and warming up good for Sunday's departure.

Valley Wells was reported to be in excellent shape for camping with water piped to the camping space and back on the side of the hill were small buildings with signs reading "Opal" and "Jasper."

The 1951 convention will be in Oakland, which showed good salesmanship with one representative that could sway the votes when San Diego had a good representation armed with souvenirs for all. There is a possibility of the 1953 meeting being held in San Diego the same time as the world's fair.

Again Jim Underwood came out with honors and a blue ribbon for his display; he sent his wife up to do all the work and he arrived later to take all the congratulations.

Seemed like a put-up job when Mr. Glenn called on Mrs. Arciniega to give us the low-down on Mr. Arciniega, how he first became interested in minerals at an early age up to the present time. As usual the Arciniegas took home the prizes from the drawings—must be a special compartment in the hat used for the drawings.

Gem stones are divided into groups, with three precious stones in one group and sixty in the other of semi-precious. There are six systems in crystallography, Hexagonal, Tetragonal, Isometric, Orthorhombic, Triclinic and Monoclinic, which all sounds so complicated until you hear Mr. Arciniega explain about the ones that resemble the tall buildings while others are like square buildings and Triclinic is "everyman for himself, no ends, just break where it wants to." He then went on to explain polorizations, double and single refraction. It was clearly brought out how to test for specific gravity by mixing solutions all in one beaker and dropping different minerals in and they would float at the correct level.

Some feel that the cutting and polishing of a gem stone destroys what nature had done but another way to look at it, is that the beauty is brought out by reflection.

There are many instruments available today to take all the work out of testing and identifying minerals, several were on display for inspection.

The next step of interest for Mr. Arciniega seems to lead towards photography as he had some close-up shots of crystals showing terminations and inclusions. When the photography bug bites, it is just about as serious as its cousin the rock hound bug, your life is never the same.

Mr. and Mrs. Allard displayed an interesting collection from many of the field trips they had attended. Mr. Strombeck brought some Aztec images of animals from his collection.

Plans are getting under way for a good representation at Las Vegas for the Labor Day holiday in September.

July Meeting

Pacific Mineral Society members and friends enjoyed an interesting talk in July by one of their own members, Mr. R. M. Glenn, who spoke on "Tungsten Minerals, Mines and Products." He brings out such interesting facts that those not familiar with the mineral names are able to follow the talk with interest.

At the time of the meeting there had been no word regarding the plaque from the Federation Convention at Trona, Calif.

On display were several collections. Mr. Jones showed about 30 specimens mostly of the phosphate and radio-active minerals from New Hampshire.

Dr. P. A. Foster was kind enough to bring some of his collection of rare, old books. While in London he spent about a week among the shelves of book stores trying to locate as many copies of early editions as possible. Some are the first printing, and some are in foreign languages. Many had color plates that the actual mineral was powdered up and mixed into a paint to produce accurate coloring of the mineral specimen. "Popular Mineralogy" by Henry Sowerby, printed in London in 1850, contained the first mineral plates ever published. Dr. Foster has the complete set of eight volumes.

In 1859 Dr. J. G. Kuri of Scotland published "The Mineral Kingdom." Brauns, "Mineralogy," printed in Germany had exquisite color plates. "The Descriptive Catalogue" by John Mawe was printed in London in 1822.

Each country seemed to have interest in mineralogy in the early days as most European countries are represented in Dr. Foster's collection. To represent the Dutch people, J. C. Weber had "Die Mineralien" printed in German in Munchen in 1871. A translation in English from German edition of earlier print was Dr. L. Feuchtwanger's "A Popular Treatise on Gems," this was printed in New York in 1859. In the collection were several books on early mining printed in 1853 and 1861, these books were used by the '49ers.

There were several postal-card size colored mineral plates from the Natural History Museum, just a few of a set of one hundred and many were colored with the mineral to give them the correct coloring.

From the American Museum of Natural History in New York were displayed four color plates of Kunzite, the mineral that was named after Dr. George F. Kunz.

Believed to be the best authority on early day minerals are listed in the following order first, the British author Henry Sowerby, second the German works by Brauns, third, the German author Bauer. There were some early books printed in French, but there are so few left it is hard to locate them.

Mr. Glenn had about 30 specimens and a Mineralight to illustrate his talk. He explained the history of Tungsten in California, how areas of commercial value are scattered over the state. In the early days it was discovered that tungsten combined with other minerals in the making of steel produced a better grade of steel to be used in armors and swords, it was called Toledo steel. The mineral received its name from the Saxon or Swedish word "tung" meaning "heavy" and "sten" meaning "stone." Mr. Glenn told about the man working in the mine that was not familiar with the word "scheelite" and responded, "she no light, heavy like ————."

Scheele, a noted chemist in 1781, located a foreign element in ores, but is believed to have been named in 1783 when a Spanish chemist separated the element and called it tungsten. There was no industrial use until late in the 1890's. The first commercial use was displayed in the Exposition in Paris in 1900 when better steel was exhibited in tools made with tungsten.

Just before World War I a German chemist perfected tool steel. In the Cornwall mine section of England, tungsten was an impurity in the tin mines, there were quantities of wolframite as by-products, the Germans collected all the surplus.

Tungsten was discovered in China about the same time it became known in Europe, by K. C. Li who noticed a very old kitchen stove that had been hand-made about 25 years earlier, it was still in very good condition and heat resistant. Mr. Li was in Cornwall England, when he realized the mineral used for hardening steel appeared very much like that used in making the early day stove. He returned to China and collected wolframite and used it in producing a better grade of steel for tools that would last longer than tools made without tungsten.

There are four important tungsten minerals, wolframite, ferberite, huebnerite and scheelite.

There are mines from Sonora, Mexico, to Washington along the Sierra Nevada range of mountains. In the Atolia area, tungsten has been taken from old gold and silver mines. A large deposit was found on Catalina Island valued at $25 a unit of twenty pounds of one-per-cent tungsten or about $1,500 a ton. Twelve thousand units were removed a month and shipped to the mainland. A family from Idaho located a large deposit by use of the Ultra-Violet Light and were able to ship from forty to fifty thousand units a month.

China has enormous deposits of commercial value and received a loan from the United States to produce and ship ore in return for the loan but Russia came along with cash and was able to buy most of that produced. Tungsten is found in South America, Bolivia, Brazil, South Africa and Australia.

Myrtle Musselman
26327 Athena Avenue
Harbor City, Calif.

Southwest Mineralogists

The Southwest Mineralogists' June meeting, held in the Masonic Temple at 41st Place and Figueroa, elected Frank Trombatore, president; James Creighton, vice-president and Marion Thomas, secretary. Mr. and Mrs. Allard gave an informative talk on historical mineral locations accompanied by pictures.

At our July meeting Mr. Victor Arciniega, mining engineer and professor of geology and mineralogy, will speak on "Pala Mountain Pegmatites." Visitors are most cordially welcome.

The August 14th meeting of the Southwest Mineralogists at the Masonic Temple, 41st Place and Figueroa, Los Angeles, California, will feature a talk and colored slides by Mr. Fort and Mr. O'Barr, collectors of the Exotic Orchid and Jungle Cactus. Our field trip for the month will be to Mint Canyon on the 20th of August, meeting at the Solemint General Store at 10:00 A.M. We are going to look for thunder eggs.

For the month of October we have planned a special program. On the nite of October 9th at our usual meeting place and time our program will be called Field Trip Night. We would like everyone to know about this, members of other societies and folks who just collect rocks. Members and friends are requested to wear field clothes. NO HOB-NAILED SHOES as the floor has been newly finished for dancing and this is a special request of the building custodian. Every one is requested to bring surplus material, cutting and mineral, for trading. There will be fun, prizes and refreshments. DO COME.

Beatrice Zehrbach, Cor Sec.
5127 W. 118th Street
Hawthorne, Calif.

Springfield Mineralogical Society

The Springfield (Vermont) Mineralogical Society, organized 16 years ago, is comprised of between 50 and 60 members, adults, and teenagers, all bent on enjoying a mutual interest and hobby.

At each monthly meeting the program committee presents a different speaker thus presenting talks, pertinent to mineralogy, on varied and interesting subjects. Among these speakers have been professors from the University of Vermont, University of New Hampshire, Dartmouth College and Harvard University. As extra interest-arresters, the committee plans field trips to mines, surrounding countryside and visits to such prominent museums as the Peabody Museum at Cambridge, Mass., and Dartmouth College Museum.

This spring the Society put on a display at the local Sportsmen's Show which received most favorable comment in the press. Hundreds of people visited the display to see the 200 unpolished specimens loaned by two members, Victor Johnson and Harold Slade. Labels gave the name and the source of each mineral.

An interesting feature of this exhibit was the materials and equipment used to make and polish stones by the members of the Springfield High School Lapidary Club. Other outstanding features were the variable speed lap, constructed by member Guy Wyman and a collection of fluorescent minerals furnished by three members, Bernard Day, Victor Johnson and Fred Nies. The changing beauty of the stones under the ultra violet light provided the visitors with a thrilling experience.

This exhibit is not the first or only exhibit the Springfield Society has to its credit. It has put on exhibits for one of the large fairs in the state, it has put on smaller exhibits in the display windows of jewelry stores and it keeps a permanent display in the town library which is changed periodically.

As a result of the interest aroused in this society, some of the young members have gone on to major in this subject in their college courses.

Eileen B. Dee, Sec.
99 Summer Street
Springfield, Vermont

The Mineral & Gem Society of Castro Valley

The Mineral & Gem Society of Castro Valley held their last regular monthly membership meeting on Friday, June 9, in the Faculty Dining Room of the Hayward Union High School. After an illustrated lecture by Dr. Charles Chesterman, Associate Mining Geologist of the California Division of Mines, San Francisco, on "Volcanic Rocks and Their Economic Utilization in California," the Society's annual election was held. The following candidates were elected: Al Breedan, President; Ward Lewis, Vice-President; Mrs. Alice Robb, Secretary; Mrs. May Meyers, Treasurer (re-elected); Mrs. Gladys Luce, Director.

Director Tom Robb made a brief report on the recent field trip to Lombardi's Ranch in search of Lake County "diamonds" and two junior members, Bob Dexter and David Coats, also told of their experiences on the expedition and showed some of their specimens.

At their last Executive Board meeting which was held Friday evening, June 23, 1950, at the home of Mr. and Mrs. P T. Myers in Hayward, the following committee appointments for the year by President Al Breedan were approved: Mrs. Buster E. Sledge, Librarian and Historian; Mrs. Sarah Breece, Social Chairman; and Dr. Arthur B. Emmes, Publicity Chairman.

At their Second Annual Picnic, Installation of Officers and Auction which was held Sunday, June 25 at the Fire Circle in Joaquin Miller Park, over 60 persons attended and approximately $100 was raised for the Society's treasury from the proceeds of the prize award and auction James Meegan, who acted as auctioneer for the occasion, closed the deal on 94 separate transactions and the following persons received the prize awards: Mrs. Alice Robb, first prize in the form of a jade pin; Bob Dexter, second prize in the form of a bloodstone ring; and Melvin Rush, third prize in the form of a travertine pen set.

Kay Finley was the lucky winner of a sterling silver Chinese carnelian necklace in the special Chinese auction conducted by Buster E. Sledge.

After installation of the following officers by Millard V. Moore, President of the East Bay Mineral Society, Oakland, Al Breeden, President; Ward Lewis, Vice-President; Mrs. Alice Robb, Secretary, Mrs. May Myers, Treasurer, and Mrs. Gladys Luce, Director, the group went on a short "field trip" to a nearby outcropping of rock where they gathered some interesting specimens of chromite schist and garnet crystals

Arthur B. Emmes, Pub. Chm.
7845 Castro Valley Blvd.
Castro Valley, Calif.

Gem and Mineral Society of San Mateo County

At the June meeting of the Gem and Mineral Society of San Mateo County, Mr. Morton Bachrach, retiring president, installed as new officers Mr. Ronald Sharp, President; Mr. Charles Parsons, Vice-Pres.; Mrs. Polly Davis, Secretary; Mr. Walter Reinhardt, Treasurer. Elected Directors are Dale Atwood, Jay Sterling, Hal Davis, Stanley Fryer, Sue Bachrach. Lloyd Mabie will lead the field trippers, Helen Young will edit the monthly bulletin, and Alice Sharp will act as corresponding secretary.

A field trip on June 25th to the Knoxville mercury mine area was well attended and resulted in fine specimens of banded agate, crystal formations, and cinnabar.

Alice G. Sharp, Cor. Sec.
P.O. Box 226
Burlingame, Calif.

Santa Cruz Mineral and Gem Society

SANTA CRUZ MINERAL and GEM SOCIETY had for its June speaker, Jack Moore, local Society member and operator of The Hobby Shop in Santa Cruz. He displayed an attractive group of specimens, including carnotite, snowflake obsidian, turquoise, variscite, petrified woods and moss jasper, which he and Mrs. Moore recently acquired on a collecting trip through California, Nevada, Utah and Arizona. Part of their trip—depicted in fine color slides—was also greatly enjoyed—which included Bryce and Zion National Parks and of Indian ruins in Arizona.

An appropriate Society emblem, designed by A. D. Godfrey, was unanimously chosen during the business meeting.

In lieu of the regular meetings for July and August the Society voted to have field trips and picnics. A field trip on Sunday, May 21, to The Pinnacles National Monument, proved very interesting.

Edythe M. Thompson, Pub. Chm.
P.O. Box 124
Soquel, Calif.

Newark Mineralogical Society

A very instructive and comprehensive talk on meteorites was given by Mr. John Albanese, a member of our society, at the meeting held on June 4, 1950.

To prepare his audience, Mr. Albanese first outlined some of the physical sciences of our planet earth, volcanoes, the moon, meteorites, the sun, the solar system and the outer stellar system. He then went on to the main subject, "a stony meteorite which fell in Maziba, Uganda Protectorate, East Africa on the 24th of Sept. 1942."

If readers of "Club and Society Notes" in *Rocks and Minerals,* will go back to the 1950 May-June issue starting on page 261, they will find a two and one half page descriptive treatise on meteorites and the famous Uganda meteorite. Part of this meteorite is now in the Museum of Natural History, New York City, a gift of Mr. Albanese.

Herman E. Grote, Pub. Chm.
95 Lenox Street
Newark, N. J.

WALTER ADAMS

(*Continued from Page* 508)

he said that he wished he could get up to the barn, and then realized that he never would again.

Walter Delos Adams is a man that will never be forgotten by those who knew him or ever met him. His life should be an example to every one of us.

Sara R. Adams
Williamsburg, Mass.

Editor's Note: Miss Sara (Sally to her friends) is a student at Williamsburg High School, Class of '52. The life story of her grandfather was sent to ROCKS AND MINERALS at the suggestion of her science teacher, Mr. Edward C. Foster, one of our valued subscribers. Part of a recent letter from her reads:

"I found just now that my grandfather had a mineral specimen from every country in the world.

"I am starting a mineral collection, too. Before my grandfather died, he had set aside a specimen for each of his grandchildren, 13 of them. My specimen was a petrified oak wood. I remember plainly his telling me that it was the first oak wood he had ever seen.

"After his death, most of the collection was sold to a dealer and what was left was given to me."

Opportunities For Lecturing And Research Abroad

(*Continued from Page* 517)

15, 1950. Requests for application forms and for further information concerning opportunities for visiting lecturers, research scholars and specialists should be addressed to the Committee on International Exchange of Persons, Conference Board of Associated Research Councils, 2101 Constitution Avenue, Washington 25, D. C.

Note: There are many openings for predoctoral graduate study and for elementary and secondary school teaching in countries participating in the Fulbright program. Inquiries regarding opportunities for graduate study should be addressed to the Institute of International Education (2 West 45th Street, New York 19, New York) and regarding awards to elementary and secondary school teachers to the Division of International Educational Relations, United States Office of Education (Federal Security Building, Washington 25, D. C.)

THE MICROMOUNTER

(*Continued from Page* 511)

from the top edge of the box, and the mount will be permanent.

Also try cementing tiny xls onto thumbtacks, which are then set into a cork in the box. Excellent for a series of forms for comparative study.

THE EARTH SCIENCE DIGEST

BOX A-28
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Attention Collectors — Warning!!!

The following letter speaks for itself:

Mr. Peter Zodac, Editor
Rocks and Minerals
Peekskill, N. Y.

Dear Mr. Zodac:

Some readers of your magazine have shown me your Crystal Hill article. In the article you tell how to get here and end it with "happy hunting" but you fail to say that it is private property and that there are 'No Trespass' notices on it.

You are advised that we will prosecute all persons trespassing on our property without a permit from me.

(signed) Charles C. Armitage
Crystal Hill Poultry Farm,
R. D. 1, Stroudsburg, Pa.

Editor's Note: The article referred to, "A Famous Forgotten Quartz Crystal Locality, Crystal Hill Near Delaware Water Gap, Penna." appeared on pages 372-373 of the last issue. We are very sure that Mr. Lee, the writer of the article, had no idea that the locality was on private ground or he would have mentioned it.

We would suggest that all who wish to visit the locality should first stop to see Mr. Armitage, buy a chicken or two or some eggs (just to show that mineral collectors are nice people) and perhaps he may give you the permit wanted. . . . .